ELECTRICAL WEST

October 1955
25 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U.S.

Two New Ideas 72

No More Requisitions 78

Marketing Eden Coming 96

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Clinics Show Way to Profits 98

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RMEL Told to Slug It Out 117

How to Keep Them in School 69

Look at the appealing features of an all-electric kitchen! Our guess is that any homemaker would find it difficult to make a "most wanted" selection from among them. This is why the current series of Edison advertisements lists *all* the features, then points out that there's no need to choose. "You get them *all* . . . in an all-electric kitchen" is the key.

As a special note to the electrical appliance dealers of Central and Southern California, we might emphasize that the list of desirable features makes a list of strong *selling points*, too. You get them *all* . . . in Edison advertising!

Edison

SOUTHERN CALIFORNIA EDISON COMPANY

Maximum seeing for this task

And for this one

Specify the efficiency, the quality, the functional beauty of

SMOOT-HOLMAN SHALLOLITE

Look to **SMOOT-HOLMAN** *for Quality*

For both close and distance vision, Smoot-Holman's new Shallolite provides far-reaching, low brightness illumination that cleans offices and stores of shadows and glare. Slim and flat-bodied it offers functional beauty eminently suited for these commercial installations. Quality-engineered construction means long service with low cost, easy maintenance. Pendants available.

Send coupon for full information

ILLUMINATION EQUIPMENT
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA
MADE IN U.S.A.

Sales Offices in Most Principal Cities.
San Francisco • Branch Office & Warehouse

SMOOT-HOLMAN COMPANY
P. O. BOX 398 • DEPT. 102 • INGLEWOOD, CALIFORNIA

Please send me complete literature.
I am particularly interested in:

☐ SHALLOLITE ☐ SCHOOL OR INSTITUTIONAL
☐ COMMERCIAL ☐ INDUSTRIAL ☐ FLOOD

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ADDRESS _____
CITY _____ ZONE _____ STATE _____

ELECTRICAL WEST

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

THE ALL-INDUSTRY MAGAZINE OF PROGRESS, ESTABLISHED 1887,
and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity."

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Next Month

November features will include status of solar heat; a new idea to improve load characteristics of electric space heating; a new all-aluminum alloy conductor (AAAC) for overhead distribution; bare ACSR racked secondary with spacer for midspan service taps; house wiring for dual secondary service; first of a series on the what and why of grounding to clarify this subject; a utility survey of new home appliance trend; and maybe the Disneyland electrical story.

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Cleveland (15) ..... Frank Seiler, 1510 Hanna Bldg., Superior 1-7000
Los Angeles (17) ..... Carl Dysinger, 1111 Wilshire Blvd., MA 6-4323
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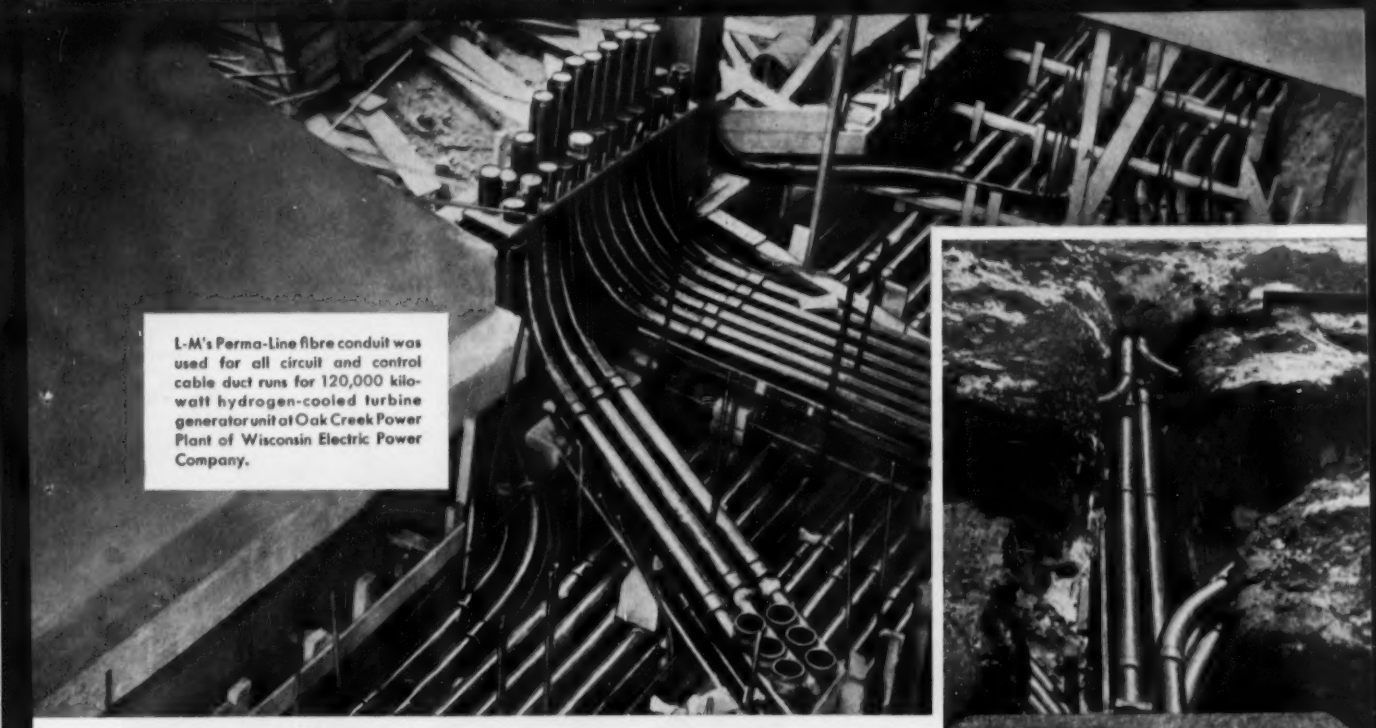
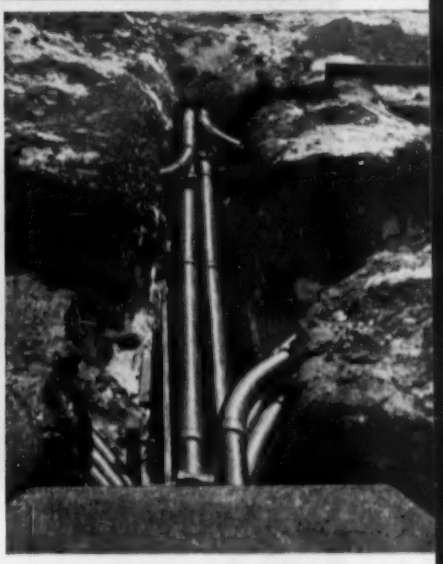


L-M's Perma-Line fibre conduit was used for all circuit and control cable duct runs for 120,000 kilowatt hydrogen-cooled turbine generator unit at Oak Creek Power Plant of Wisconsin Electric Power Company.



Above, L-M's Perma-Line fibre conduit is being installed in the Burleigh Substation, Wisconsin Electric Power Co. Duct has smooth inner bore and smoothly rounded bell ends in manholes so cable sheath will not be cut or marred.

L-M's Perma-Line™ Conduit Assures a Lifetime of Trouble-Free Service

L-M's Perma-Line fibre conduit is manufactured within close tolerances and according to rigid test requirements to assure trouble-free service for all generating station, substation, and underground system applications.

L-M's Perma-Line is corrosion-, vermin-, and leak-proof. It has an unusually high tensile strength. Joints are quickly and easily made by simply tapping the tapered coupling onto the tapered end of the conduit. Joints are watertight and safe from seepage of wet concrete and soil water. L-M conduit's smooth inner bore makes cable easier to pull and reduces cable sheath abrasion. Fibre conduit comes in long lengths. It's light, easy to handle; and you'll find it can be laid faster than many other types of ducts.

Complete Accessories

Prefabricated base and intermediate spacer units are available to keep installations rigid and evenly aligned. Spacers have special locking feature to make any combination of duct configuration.

L-M provides a variety of bends and angle couplings, including 5° angle coupling, S-bend, 45° and 90° bends. The 5° angle coupling provides for long radius turns and offsets; S-bend provides a 20" offset. Special bends are available on order.

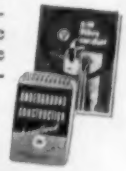
Bell ends for use at conduit terminals in manholes provide a smoothly rounded opening that will not cut or mar the cable sheath.

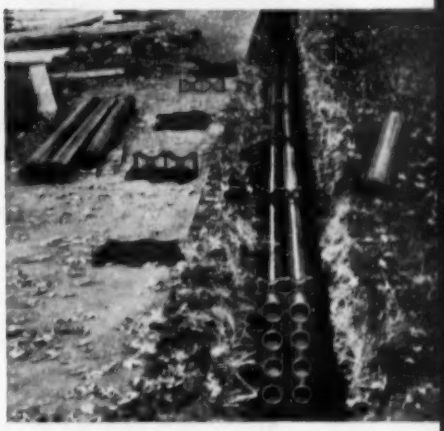
Fibre caps provide a watertight, vermin-proof seal for conduit lines prior to drawing cable. Easy to remove for reuse.

L-M Perma-Line fibre conduit is available in 5-foot lengths, sizes 2, 4, 5, and 6 inches; also 8-foot lengths, sizes 3, 3½, 4, 4½ and 5 inches.

Get Complete Information

L-M offers a completely engineered system for conduit installations. Ask the L-M Field Engineer for a copy of the 12-point plan folder, which shows how easy it is to use our system; also for L-M's underground construction handbook and Bulletin UG1A, which gives complete specifications. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).





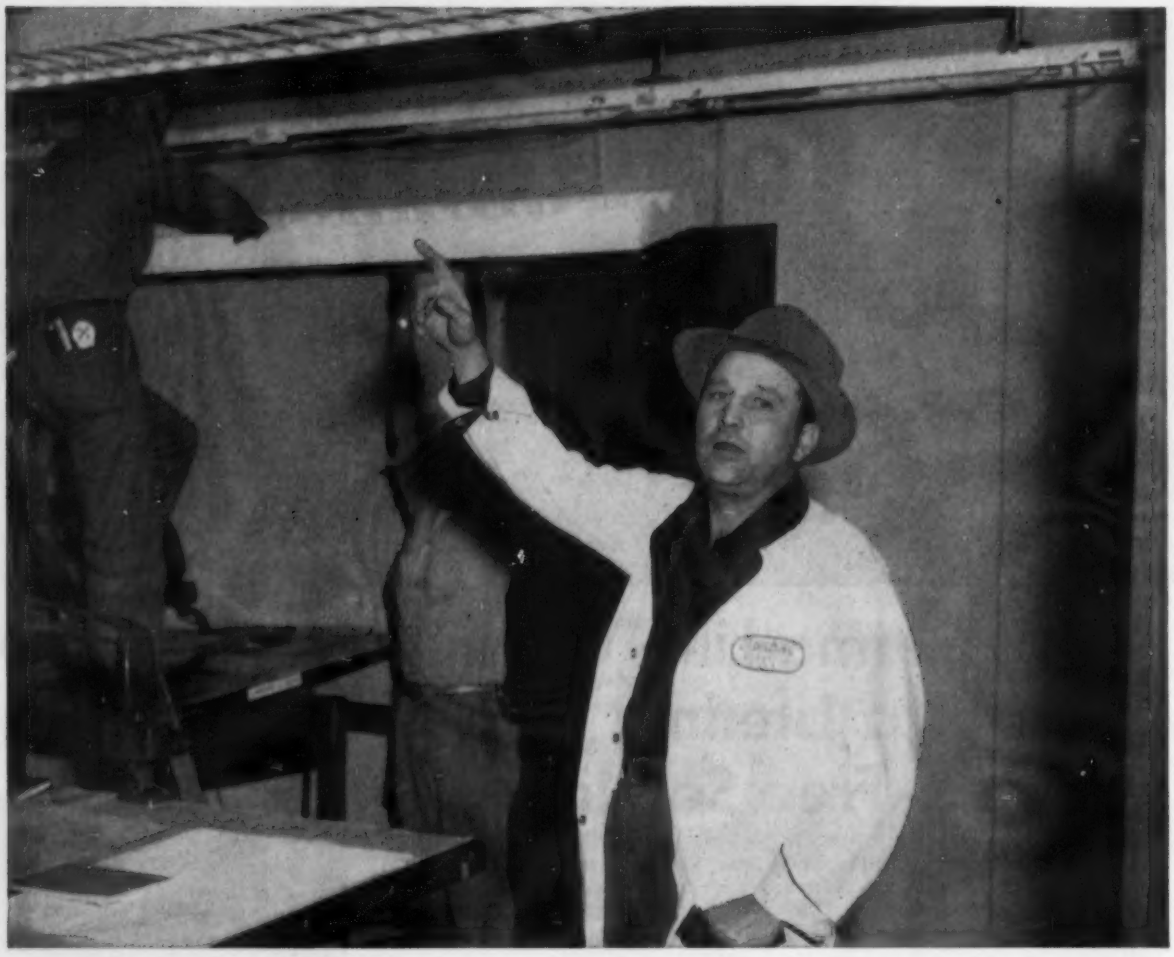
It is easy to construct a solid, well-aligned installation with L-M's Perma-Line fibre conduit and easy-to-use accessories. The illustration above shows use of L-M base and intermediate spacers, to assure firm, even spacing.

L-M's new tapering tool and fibre conduit vise duplicates the smooth, precision factory-cut tapers in the field. It pays for itself through savings from 100% salvage of field-cut ends.

LM® **LINE MATERIAL**

Fibre Conduit

226"



A. B. Haines of Central Electric Co., Memphis, installing Day-Brite Luvex® Fixtures on a relighting job at Rotary Lift Co., Memphis.

Contractor Armie Haines points out a few Day-Brite advantages

Armie Haines, co-owner of Central Electric Company, Memphis, has been working with Day-Brite Lighting Fixtures for about 15 years. Naturally, he knows what he is talking about. This is what he says:

"Since Day-Brite provides proper tooling for the manufacture of its fixtures, parts are interchangeable—installation time is speeded up.

"We save up to 25% installation time, and costs, when installing Day-Brite equipment such as the Luvex.

"Here's another labor saver—8-ft. enclosures are a distinct advantage over 4-ft. enclosures. Save time.

"Sliding clamp hangers allow for variations of hanger spacings usually encountered in relighting jobs.

"The finished job is much more satisfactory—that helps us get additional work through satisfied customers."

Contractors all over the United States are equally enthusiastic about Day-Brite fixtures. Profit by their experience SEE, EXAMINE, COMPARE—CALL YOUR DISTRIBUTOR.

5465

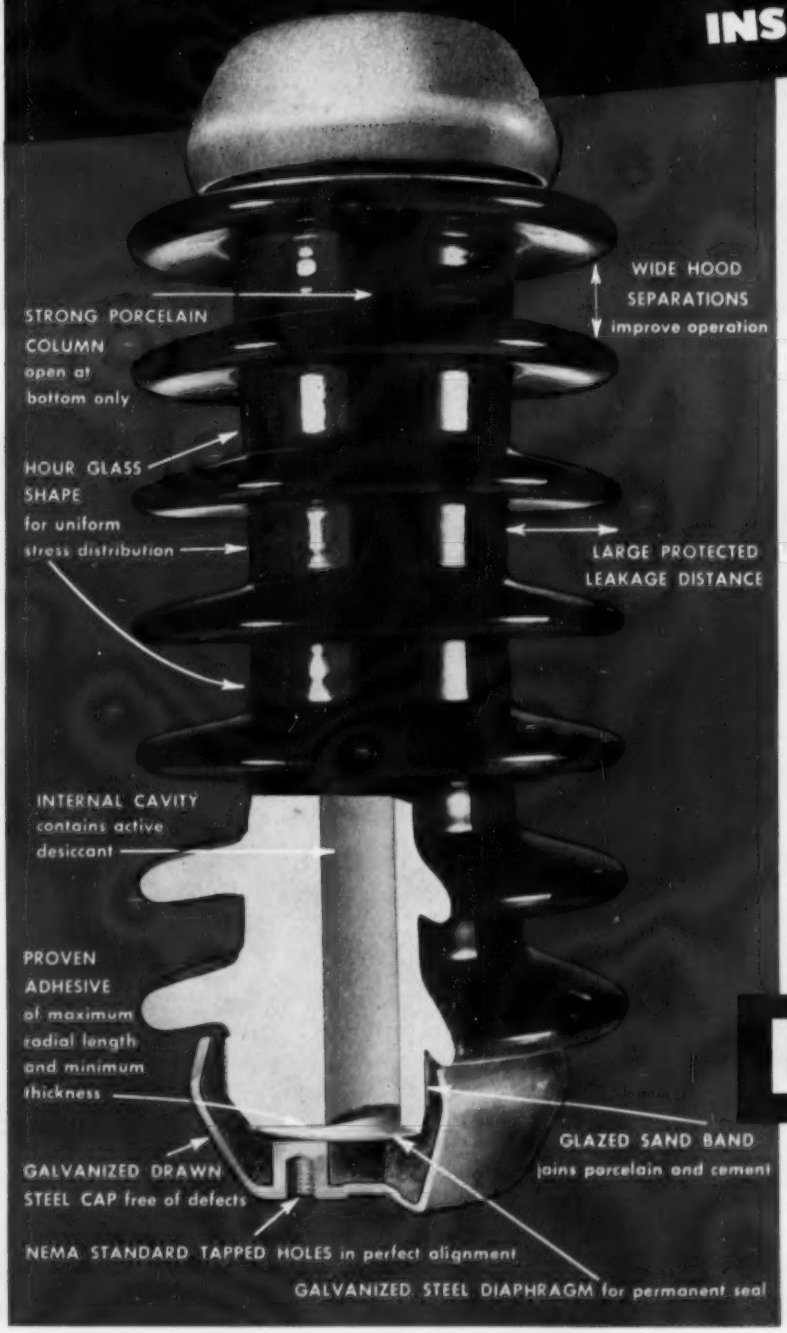
Day-Brite Lighting, Inc., 5412 Bulwer Ave., St. Louis 7, Mo.
In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario.

"DECIDEDLY BETTER"
DAY-BRITE
Lighting Fixtures

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

NEW ADDITION TO LOCKE LINE OF APPARATUS INSULATORS

LOCKE'S NEW STATION POST SWITCH & BUS INSULATOR


WIDE HOOD SEPARATIONS improve operation
STRONG PORCELAIN COLUMN open at bottom only
HOUR GLASS SHAPE for uniform stress distribution
LARGE PROTECTED LEAKAGE DISTANCE
INTERNAL CAVITY contains active desiccant
PROVEN ADHESIVE of maximum radial length and minimum thickness
GLAZED SAND BAND joins porcelain and cement
GALVANIZED DRAWN STEEL CAP free of defects
NEMA STANDARD TAPPED HOLES in perfect alignment
GALVANIZED STEEL DIAPHRAGM for permanent seal

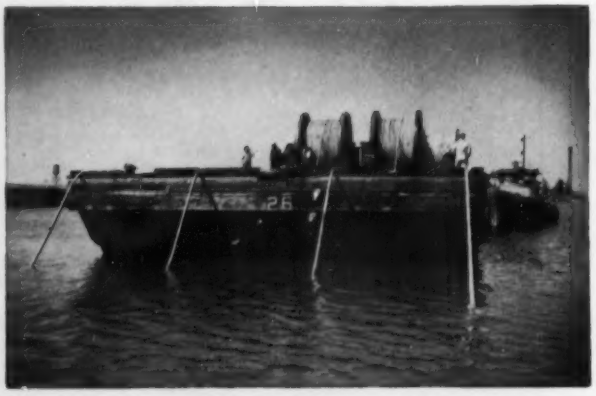
While you may prefer regular Cap and Pin type Switch and Bus insulators . . . you may be one of those who also use Station Post apparatus insulators. If so, here's a new Station Post especially designed to reduce corona and radio interference . . . particularly where industrial contamination and fog tend to lessen effectiveness of earlier station post designs. Modern design features of this new Station Post are shown by cutaway photo at left . . . but these are described in much more detail in a separate brochure . . . LA106. Ask your Locke representative for a copy . . . or write direct.

LOCKE

LOCKE DEPARTMENT
GENERAL ELECTRIC COMPANY
BALTIMORE, MARYLAND

FIRST INSTALLATION in the Tiger Brand Submarine

The first step. Cable is winched to shore where it is terminated at top of pole. This is only one of four such cables.



Barge begins to move across river. The four cables are kept about 10 feet apart all the way. 4th cable is a spare for future use.

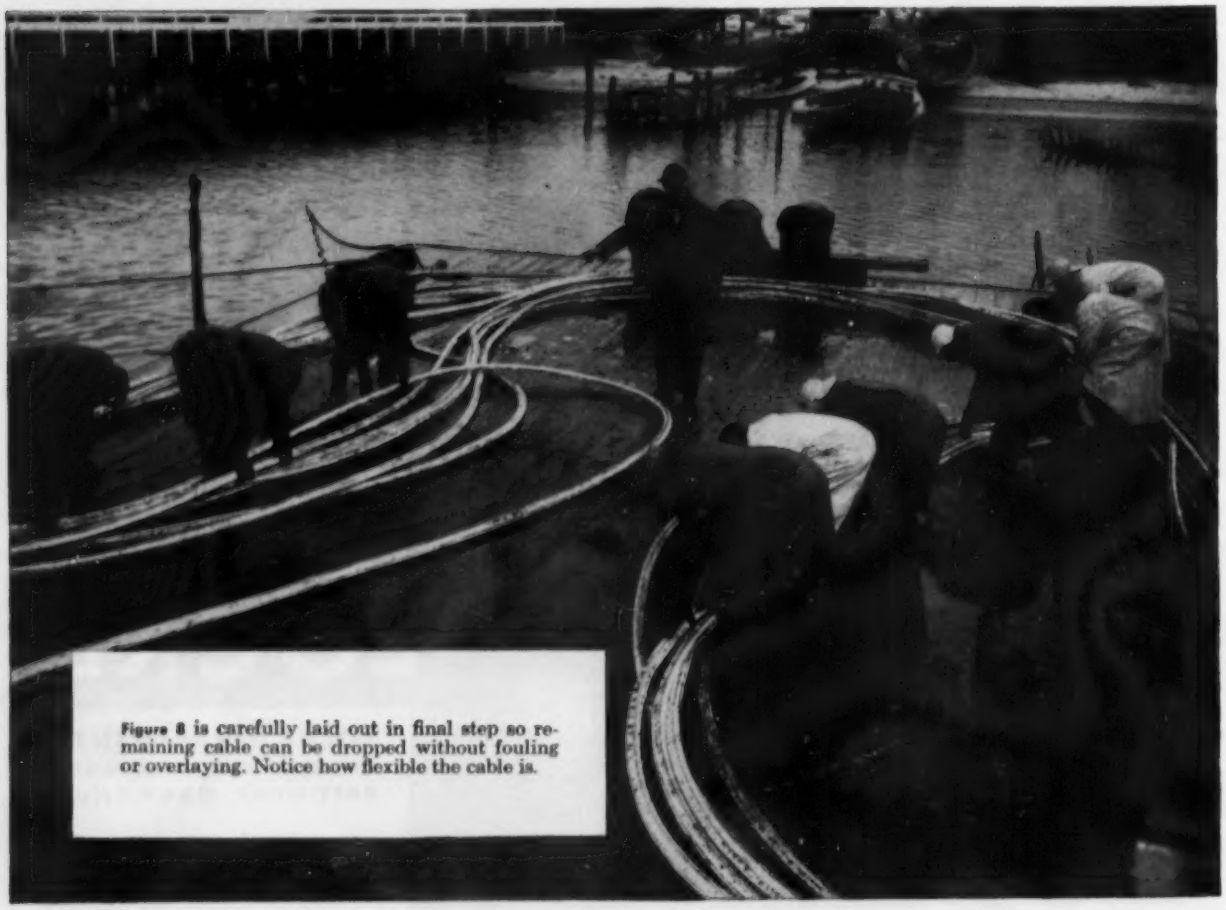


Figure 8 is carefully laid out in final step so remaining cable can be dropped without fouling or overlaying. Notice how flexible the cable is.

United States:

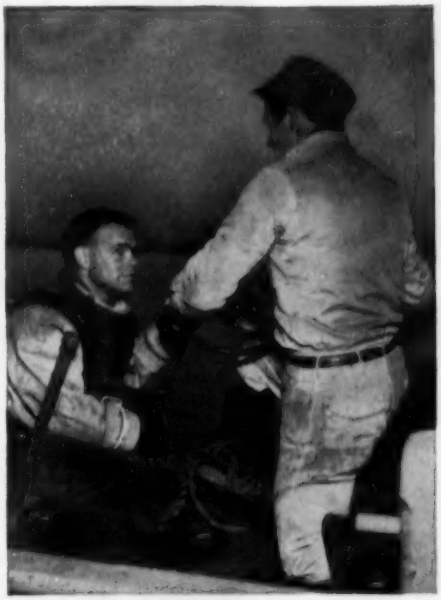
Cable with aluminum armor —in salt water

VIRGINIA ELECTRIC & POWER COMPANY has been using Tiger Brand for 31 years—but the installation shown here features a radical departure from standard cable constructions. To span the brackish Elizabeth River, VEPCO sunk four 3000 ft. single conductor 500 MCM paper lead cables rated at *38,000* volts. The armor is #6 BWG aluminum alloy type 52S-H34, covered with asphalt and jute.

This new aluminum armor is 70% lighter than conventional armor, so it will be much easier to lift the cable if it fouls. The company expects 20 to 30 years of service from the cable.

Why they picked aluminum armor: Because of its non-magnetic properties, the aluminum armor reduced power losses, and it reduced reactive voltage drop. The light weight was also a factor, since it made repairs easier. Extensive tests indicated that corrosion would not be a problem, even in these saline waters.

Just name your expected operating conditions—and there's a good chance that we can supply a standard Tiger Brand cable to do the job. High voltage underwater power cable, flexible dredge cable, cable for power shovels, mine cars or portable hand drills . . . Tiger Brand is designed for those unusual applications where highest possible quality is a must. Call your American Steel & Wire representative.



Here, J. F. Crofton, an independent diver, goes to the bottom to check for fouling. Cables lie in 5 to 10-foot-deep trench, will operate at 34.5 KV.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

A STANDARD TIGER BRAND CABLE FOR EVERY SPECIAL JOB!

- asbestos wire and cable
- mold cured portable cord
- aerial, underground and submarine cable
- shovel & dredge cable
- paper & varnished cambric cable
- machine tool & building wire
- special purpose wire & cable

USS Tiger Brand **ELECTRICAL WIRE & CABLE** USS

UNITED STATES STEEL

Mr. W. T. Pyle displays the new, compact Westinghouse DB breakers now rated to a maximum of 150,000 amps.

NEW exclusive functions in L. V. air breakers now up to 15,000 amps interrupting capacity

Three new design developments make Westinghouse L. V. circuit breakers the most versatile, the most useful you can buy.

1. Two new ratings—the DB-75 and DB-100—provide you now with a complete line.
2. Interrupting ratings on all frame sizes have been increased on 240-volt and 480-volt nonselective applications to a maximum of 150,000 amps for the DB-100 at 240-volt.
3. The entire line of DB breakers is equipped with the new air-delayed overload tripping device with a unique range of adjustability, giving you new application opportunities—standard instantaneous and long-time-delay characteristics with a *total of 9 calibrated settings,* or, selective tripping units with numerous combinations of long- and short-time delay, *totaling 13 settings.*

There's more to the story—call your Westinghouse sales engineer, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60885

Nonselective Application Ratings for DB Breakers

Frame Size	Old Rating	New Rating 240 volts	New Rating 480 volts
DB-15	15,000A	30,000A	25,000A
DB-25	25,000A	50,000A	35,000A
DB-50	50,000A	75,000A	60,000A
DB-75	75,000A	100,000A	75,000A
DB-100	100,000A	150,000A	100,000A

YOU CAN BE SURE...IF IT'S Westinghouse

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver

BETHEA

"DA-30"
ALUMINUM
DEAD-END
CLAMP

2/0-477 ACSR
2/0-556.5 ALL-ALUMINUM

The "DA-30" is a larger version of the very popular "DA-20" which has been featured in a previous advertisement. This clamp combines very compact dimensions and light weight with an exceptional clamping range. It is intended to supplement the smaller "DA-20" when the increasingly popular circular mil sizes of conductor are used for distribution and sub-transmission work. Slip strengths developed are more than adequate for pole line type construction.

SPECIFICATIONS

Clamping Range	Ultimate Strength	Weight
0.40-0.875	15,000 lbs.	4.2 lbs.

Body and Keeper . . . High Strength, heat treated aluminum alloy. Hardware . . . Hot dipped galvanized steel . . . Cotter pin . . . Humpbacked silicon bronze . . . Connecting piece . . . Hot galvanized malleable iron.

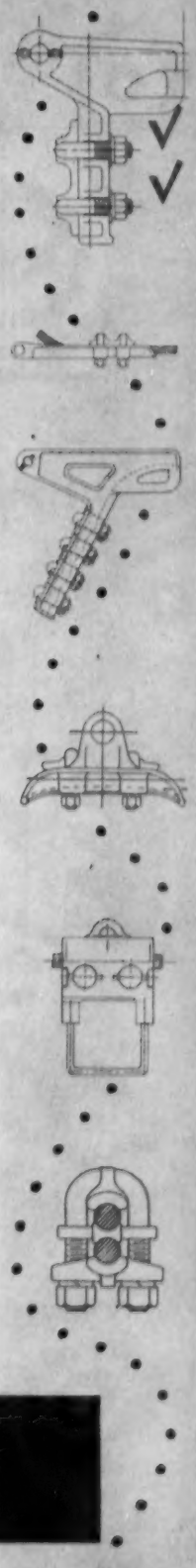
Insulator attachment fittings are required and are furnished as standard items. Regular price includes socket or clevis fittings as specified.

TEST DATA

By Pittsburgh Testing Laboratories

Type Test	Cable Size	Max. Load
Slip strength	2/0 ACSR-6/1	5,800 lbs.
Slip strength	3/0 ACSR 6/1	5,750 lbs.
Slip strength	4/0 ACSR 6/1	8,275 lbs.
Slip strength	336.4 ACSR 26/7	7,700 lbs.
Slip strength	397.5 ACSR 18/1	7,700 lbs.
Slip strength	397.5 ACSR 26/7	8,000 lbs.
Slip strength	397.5 ACSR 30/7	10,550 lbs.
Slip strength	336.4 All-Alum. 19 Strand	6,300 lbs.
Clamp Ultimate	Steel Bar	18,800 lbs.
Pulling Eye Ultimate	Steel Cable Loop	12,300 lbs.

advanced design

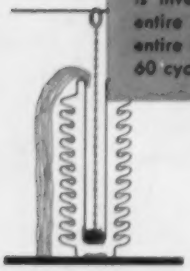


Bethea COMPANY, INCORPORATED
P.O. BOX 1407 BIRMINGHAM 1, ALABAMA

West Coast Representative:
F. E. POPE • P. O. BOX 249 • BURLINGAME, CALIFORNIA

ALUMINUM CABLE FITTINGS

100% ELECTRICAL TESTING • Soundness of head (where such a ceramic piece is most likely to be cracked) is assured by flashover test of every piece. Before plugging or assembly, porcelain body is inverted, a chain dropped the entire depth of the hole, and the entire unit subjected to a 3-minute 60 cycle flashover.

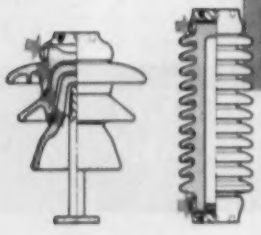


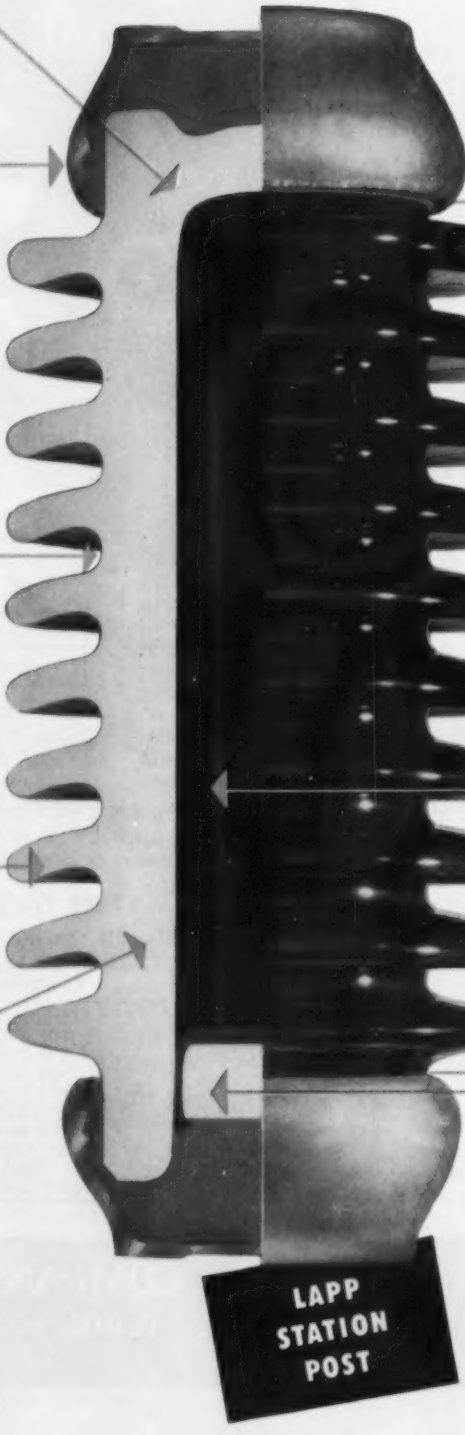
HARDWARE EXTERNALLY ATTACHED • Bases and caps are cemented ON. Porcelain is loaded only in large-area low-intensity compression grip; this eliminates the cause of insulator cracking.

UNIFORM LEAKAGE PATH • Leakage distance secured through multiple short petticoats—*Lapp fog-type design.* Flanges are spaced for natural cleaning action of wind and rain—avoid concentrated hot-spots where local stress can precipitate flashover. This is also the ideal surface for horizontal mounting of insulators.

SHORT STURDY PETTICOATS • Protect body from impact or flashover. Will withstand much more severe attack than required to crack shell-type units, yet will finally break off clean and leave body undamaged.

RIGID UNDER DEFLECTION • One piece porcelain body. No nested porcelain parts, no internal pins, studs or inserts—no internal forces to load porcelain in tension.





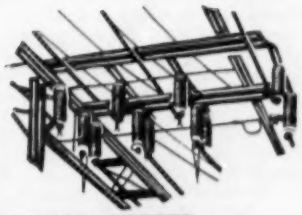
The service record on switch and bus insulators on any major system will show the superiority of Lapp Station Post insulators. Since 1931, these units have been handling dirt conditions, lightning flashover, mechanical shock and loading—with fewer outages, and at lower maintenance and replacement cost, than any other type of station insulator. One reason, of course, is the basic superiority of the design—the Lapp conception of giving mechanical as well as electrical responsibility to a column of porcelain. The other reason is that *Lapp knows how to make 'em*—how to take advantage of the special strengths of porcelain and avoid its weaknesses. The result is the Lapp Station Post; it will improve service and save money on *your* system. Lapp Insulator Co., Inc., Le Roy, New York.

. . . . THE INSIDE STORY

of Station Post reliability

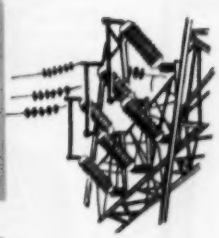
"STRAIGHT-LINE" FLASHOVER • Live terminals are separated by full length of insulator; flashover goes outside the unit. Loss of one or more petticoats does not reduce flashover distance.

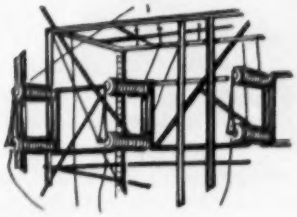
INSIDE GLAZED • All Lapp Post porcelains are glazed inside and outside—a Lapp extra-quality feature that makes for added cleanliness and more critical visual inspection.



PERMANENTLY PLUGGED PORCELAIN • *After thorough electrical testing,* porcelain body is plugged with porcelain and natural rubber—a Lapp design that has stood the service test of 20 years. This assures a permanently clean, dry hole; avoids internal conductive contamination.

SAME STRENGTH INVERTED • Mount 'em upright, obliquely, horizontally, or inverted—mechanical and electrical characteristics give a safe margin of operating security.





Lapp

WESTERN REPRESENTATIVES: Los Angeles: Earl S. Condon Co.; San Francisco: C. E. Ingalls & Sons; Seattle: Charles F. James; Butte: R. E. McDonough Co.; Salt Lake City: Ritter Engineering Co.

CARCO

Steel Light Poles

Carco Junior steel light poles are fabricated from 11-gauge, hot-rolled carbon steel. Mounting height is 21' 6" and upswept bracket length is 4'. Carco Juniors are anchor base type suitable for underground wiring but modifications permit overhead wiring when desired. At Oak Forest, 6.6 ampere incandescent bulbs are being used. Pole spacing is 250'. Started 8 years ago, Oak Forest is now a community of more than 6500 homes. Developer Frank W. Sharp is also installing Carco light poles in Scenic Woods, a new 2000-home subdivision northeast of Houston and in Sharpstown, the nation's largest subdivision, where the first of a total of 25,000 homes are under construction.

$16,000,000 Houston Subdivision Uses 210 Carco Junior Light Poles

Frank W. Sharp, builder of the famous Oak Forest subdivision in northwest Houston, Texas, solved a street lighting problem with Carco Junior (residential type) steel light poles. Sections 15 and 16 of Oak Forest, when completed, will contain 1150 homes and 16 miles of paved streets. To illuminate these streets, 210 Carco poles will be installed.

The reasons Carco Junior poles were specified by Oak Forest are worthy of consideration by others needing street lighting poles. The contractor states Carco poles were bought because they are "sturdy, good looking and economical." Now that over half are up and functioning, the contractor says they are "very satisfactory."

Carco is the first manufacturer to design and fabricate a standard light pole suitable for residential developments, parking lots, service stations, industrial areas, etc. Meeting all the requirements of the I.E.S. street lighting code, Carco Juniors, like all Pacific Car poles, are built to high strength factors to guard against the hazards of traffic accidents, wind and adverse weather conditions. Whatever your light pole needs, wherever you may be, you'll find Carco can supply a better pole and, in all probability, at a saving. Be sure to get a Carco quotation on your specifications. Prices on special poles also given upon request.

Send to our Light Pole Division for copy of catalog on standard Carco Steel Light Poles.

PACIFIC CAR AND FOUNDRY COMPANY
RENTON, WASHINGTON

STEEL LIGHT POLES, RAILROAD CARS, TRACTOR EQUIPMENT: Winches, Logging Arches, Log Carts, Dozers
STRUCTURAL STEEL FABRICATION AND ERECTION, STEEL CASTINGS, FORGINGS

CARCO®

New Current Transformer

"Do-It-Yourself" Kit Solves Stocking Problems

EXTRA LARGE OPENING of 600-volt through-type transformer makes possible easy conversion.

KIT CONTAINS insulated primary conductor, two primary bushing inserts, and two primary terminals with gaskets. Complete instructions make changeover easy.

New "do-it-yourself" kit converts a through-type 600-volt indoor-outdoor current transformer into a bar-type 5000-volt current transformer for either indoor or outdoor use. You get two voltage classifications, four possible uses from a single current transformer. The changeover is easy. Complete inserts and instructions come in a handy kit. You need only one unit in stock for two uses of two voltage classifications. Best of all, by using this kit on a 600-volt unit, you can cut cost of 5-kv metering.

Heart of this cost-cutting, stock-saving idea is Allis-Chalmers molded epoxy resin through-type 600-volt current transformer. It is available for 200-5, 400-5, 600-5 and 800-5 amp ratings, performing satisfactorily up to 200% continuous current. Its large opening is sufficient to take inserts that convert it for 5000-volt service.

Get full information on how you can take advantage of this completely new idea for cutting costs, saving on stocking. See your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wis.

A-4786

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

On all wiring in 2000-unit La Mirada project...

California contractor connects with SCOTCHLOKS!

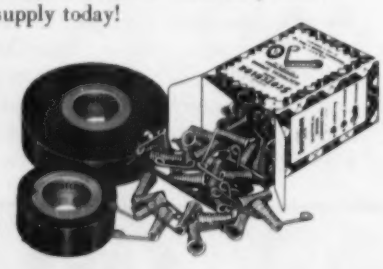
REG. U.S. PAT. OFF. BRAND

Mike Clamage, electrical contractor for the new 2000 unit La Mirada housing project in Southern California, writes: "We have been using 'SCOTCH' Brand No. 33 tape for years, but during the past year, have used 'SCOTCHLOK' Connectors in a limited way only. Some of my men preferred 'SCOTCHLOKS', while others liked crimp-type connectors. Quite frankly, I have, until now, always felt that a soldered and taped joint was the only safe and sure splice.

"I am now convinced," he goes on, "that there is a definite saving in time when using 'SCOTCHLOKS' rather than solder or crimp connectors. And the reserve spring tension of 'SCOTCHLOKS' insures a good, safe, permanent connection. That's why I'm using 'SCOTCHLOKS' and 'SCOTCH' 33 on all 2000 homes in the new La Mirada project."

Try this top team yourself! "SCOTCHLOK" is now available in four sizes—for 18 to 2 wire gages, and "SCOTCH" 33 is sold in the popular ¾ in. x 20 ft. "Job Size" rolls, or ¾ in. x 66 ft. "Economy Size" rolls. Check your supply today!

PRODUCT OF 3M RESEARCH



REG. U.S. PAT. OFF.
SCOTCH BRAND **Electrical Products**

The term "SCOTCH" is a registered trademark of Minnesota Mining and Manufacturing Company, St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N. Y. In Canada: P. O. Box 757, London, Ontario.

3M COMPANY

The link between you and satisfied customers

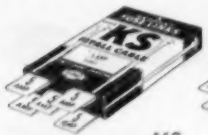
KEARNEY
FUSE LINKS

To restore service faster

Linemen work faster when all they need to do is pull the handy KEARNEY Fuse-Pak tab to unpack a fuse link. It's by far the most efficient method of packing . . . particularly when men are wearing heavy gloves and working in bad weather. As an added help, every KEARNEY Fuse-Pak is brightly color-coded to save time and prevent mistakes.

To prevent unnecessary outages

You can keep even the most troublesome circuits in operation safely with these "coordination-engineered" KEARNEY Fuse Links. They are available in six types to suit your particular requirements:

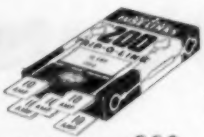


KEARNEY Type KS

Specially designed to protect and still keep outages at a minimum on circuits subject to switching and lightning surges. KS overload capacity is identical with Type 200, but surge capacity is twice as great.

KEARNEY Type X

A specialist at keeping transformers in service during heavy overloads and surges... yet clears the fault before damage range is reached. Opens 230% of rated current within five minutes.



KEARNEY Type 200

Specially made for troublesome circuits that are subject to long-time overloads and surges. Overloads up to 150% can be carried indefintely without damage to fuse link or cutout.

KEARNEY Type QA

The QA link is designed to open at a lower percentage of rated current, and therefore will melt more rapidly than fuse links of the same ampere rating which have been designed to open 230% of rated load within five minutes.

KEARNEY Type K

EEI-NEMA standard fast fuse link.

KEARNEY Type T

EEI-NEMA standard slow fuse link.

JRK 203W

For Better Construction . . . Safer Maintenance

Specify **KEARNEY PRODUCTS**

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

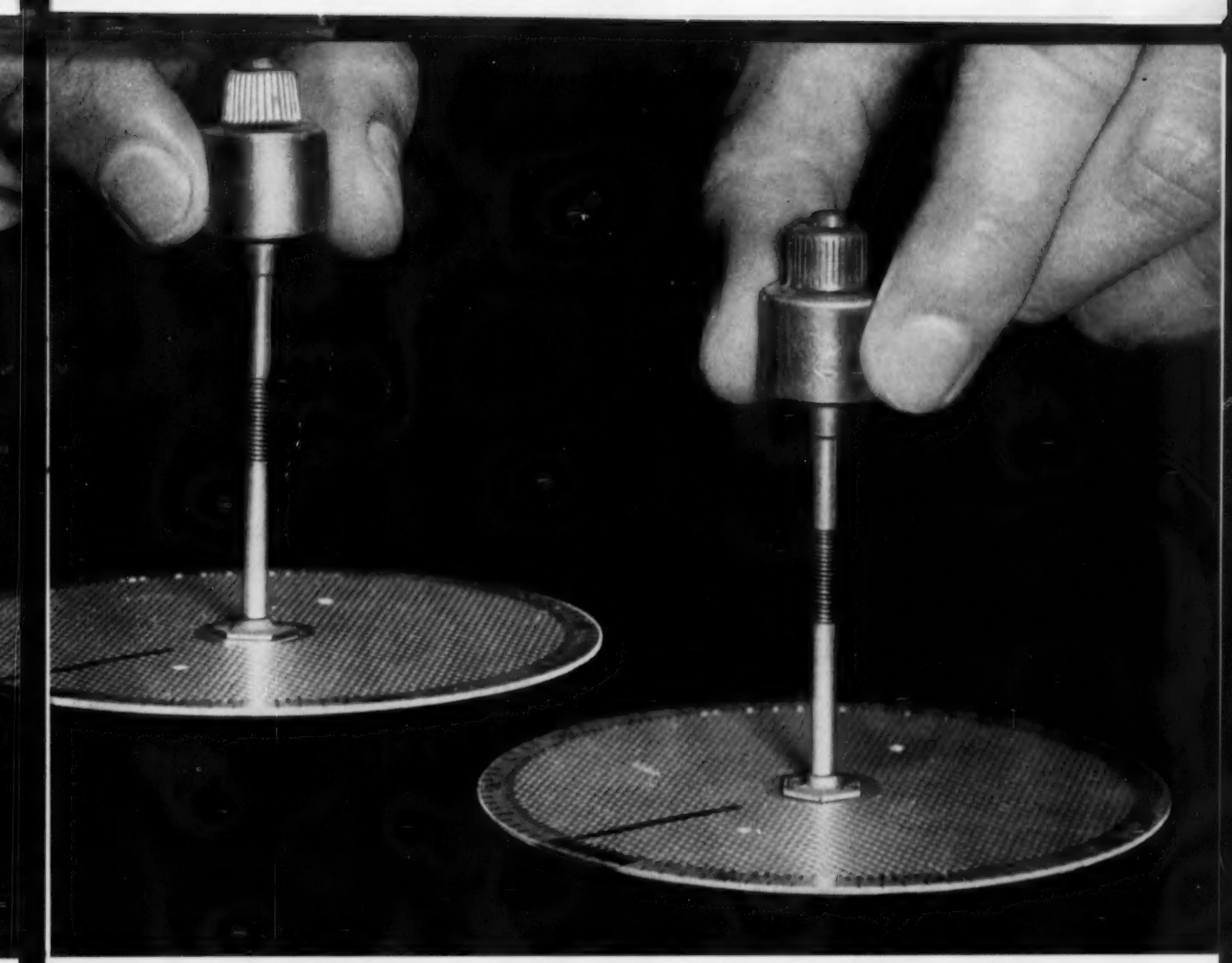
The Mark of Quality

MAYDWELL & HARTZELL, *INCORPORATED* • **WEST COAST DISTRIBUTORS** • Los Angeles • San Francisco • Portland • Seattle • Spokane • Phoenix

AFTER 250 MILLION DISK REVOLUTIONS, or an equivalent of more than 300 years of meter operation, life tests show no bearing wear in General Electric's magnetic suspension system.

Life Tests Prove...

LABORATORY RUNNING TESTS on sample lots of General Electric's I-50 meter family serve as additional checks on over-all meter performance and the lifetime characteristics of the magnetic suspension system.



No Bearing Wear

A true lifetime bearing system, already having registered the equivalent of more than 300 years' use under normal operating conditions, is now assured with all members of General Electric's I-50 meter family. Results from continuing accelerated life tests, conducted in General Electric research laboratories, prove that the revolutionary magnetic suspension system eliminates the need for bearing replacement.

These General Electric meters have registered more than 250 million revolutions of the floating disk. This is equal to over 300 years of meter operation at the national average load of 3000 KWH annually. Results show no measurable wear on the graphite washer or guide pin in G.E.'s magnetic suspension system.

These tests substantiate the perfect record of the magnetic suspension system in the more than 6,000,000 I-50 meters in service today. They offer proof that G.E.'s meter family—by eliminating bearing maintenance and replacement expenses—assures you of lower metering costs. For more information contact your nearest G-E Apparatus Sales Office or write General Electric Company, Section 621-4, Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

To postpone electric utility investment in added generating station capacity

—an Electro-Mobile Power unit, costing about $100 per kw., places 1,000 kw. at any point of need...

—reducing fixed charges...

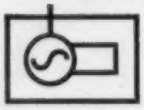
—obviating all new high-line expense...

—eliminating transmission-line loss.

It can be completely self-operated...

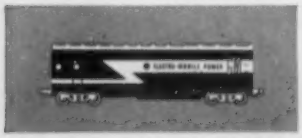
—and later used to fill other needs, anywhere, in a speedy, economical relocation.

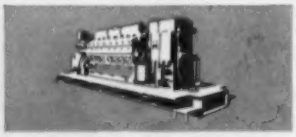
Write for simple formula explaining investment advantages of Electro-Mobile Power to:



Rail car, truck trailer and portable units— 350 to 1,000 kw.

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS • LA GRANGE, ILLINOIS





Sold and serviced directly through a manufacturer's organization. Electro-Motive Division offices located in: New York City, Chicago, Jacksonville, St. Louis and San Francisco.

Hang the load on Hubbard Hardware...

Hold the load with Hubeye bolts, eyes, and nuts

Bolts, eyes, and nuts—the indispensable items of the electrical industry—are specifically designed by Hubbard with careful attention to the functions which they must serve.

The large radius rounded section of the Hubeye prevents excessive localized strain on the guy, and the smoothly rounded high sidewalls prevent concentrated strain on individual strands.

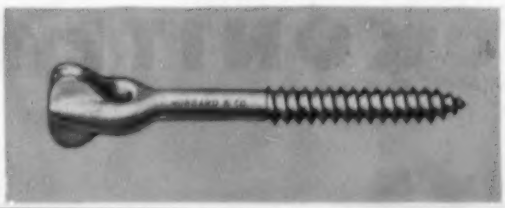
Hubeye popularity has led to its standardization for all Hubbard attachments where time, money, and maintenance are saved by elimination of the thimble.

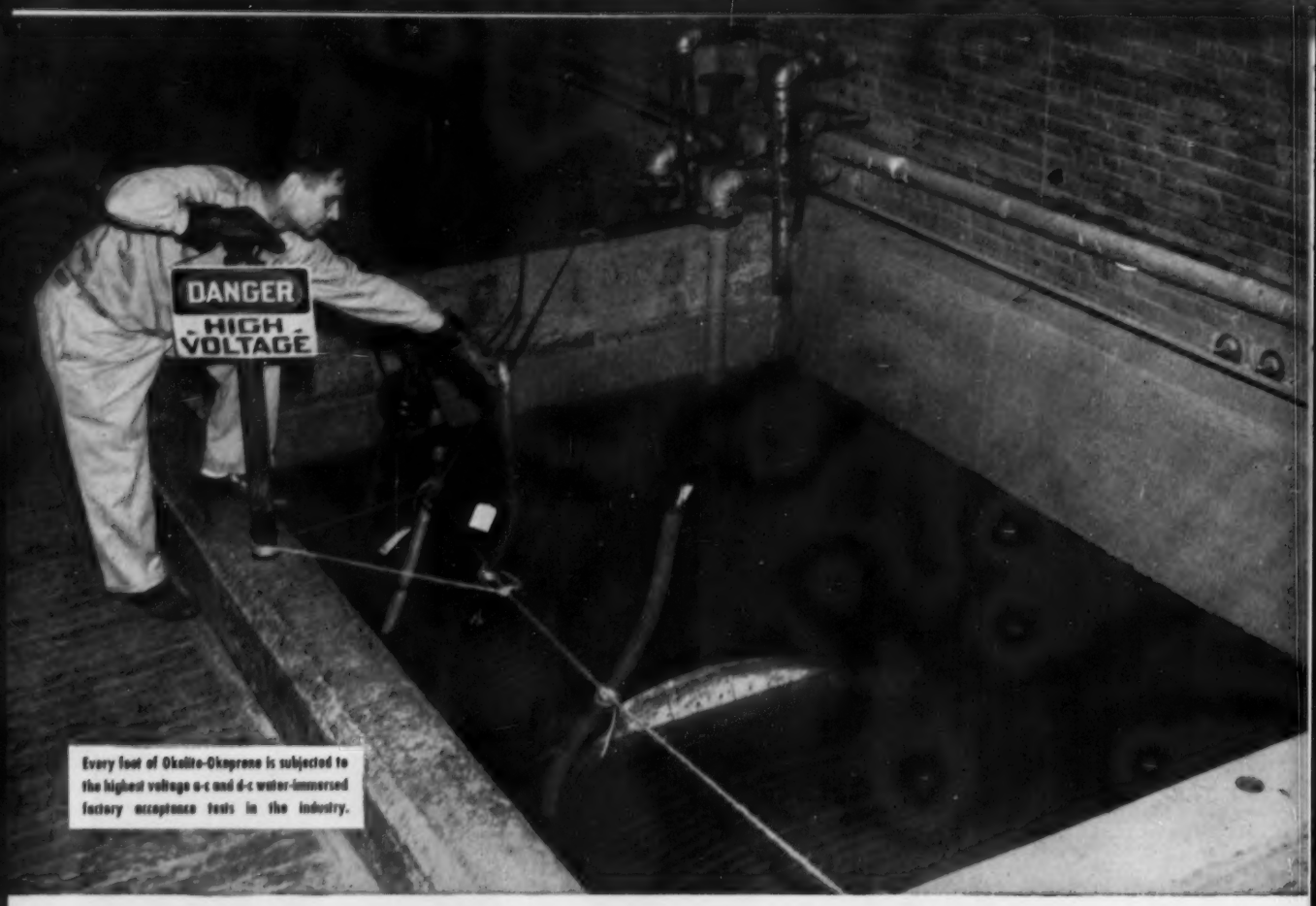
Hubeye bolts, eyes, and nuts are furnished in sizes to meet EEI and REA specifications, and are carried in stock by your nearest Hubbard electrical distributor.

Also available are crossarm and double arming bolts which have the original Hubbard DRIVE-POINT feature. All bolts and lag screws are formed from new open hearth steel and are Hubbard Double-Dip Hot Galvanized. Special care is used to keep threads clean and smooth during galvanizing.

HUBBARD AND COMPANY

Pittsburgh 1, Pa.
Chicago 50, Ill.
Oakland 8, Cal.





Every foot of Okolite-Okoprene is subjected to the highest voltage a-c and d-c water-immersed factory acceptance tests in the industry.

why Okonite cables last longer

Field service is the only true test of a cable's worth. And one case history after another shows that Okonite cables have given years of outage-free operation under the most difficult conditions. Premium materials and careful manufacturing methods have helped build this record. But materials and methods alone do not make dependable cable. Built into every Okonite construction are two all-important extras: research and quality control.

Take quality control. One man out of every six at Okonite is engaged in testing. During each phase of production, Okolite-Okoprene cables are inspected and tested to make certain they meet Okonite's standards. The following list of quality controls are not generally used by other cable manufacturers, but are *always* used at Okonite. Many of these controls are distinctive Okonite developments.

1. The use of the strip-insulating process, which applies a series of insulating strips of controlled thickness, insures a uniform wall of insulation and sheath.
2. Every foot of cable is subjected to the highest voltage a-c and d-c water-immersed factory acceptance tests in the industry.
3. Each batch of insulating and sheathing compound must meet a series of tests before it is applied to the conductor.
4. Foot-by-foot electrical testing and inspection of the insulation and sheath is carried on both before and during application to the conductor.
5. Okolite-Okoprene cables are always vulcanized in a metal mold to obtain maximum density and uniformity.

Service records prove beyond a doubt that these Okonite control methods result in dependable, longer-lived cables. The Okonite Company, Passaic, N.J.

Available with either copper or aluminum conductors

OKONITE OKONITE SINCE 1878 ***insulated cables***

2892

SUNBEAM LIGHTING MAKES SMALL OFFICES BIG

Whether it be for an executive's sanctum sanctorum or a busy secretarial office, Sunbeam Lighting Company stands ready to provide the "just right" illumination for a pleasant, friendly atmosphere which lends character and dignity to the private office and work efficiency for all offices.

Look carefully at the Sunbeam lighting installations below which lend a "big" look and a feeling of spaciousness to small offices. See how they help develop the decorative themes, add architectural interest, and provide the kind of quality-engineered illumination on which Sunbeam Lighting has built its proud name. From small offices to large commercial and industrial interiors there's a Sunbeam Visionaire® engineered to meet your most exacting requirements for long-lasting lighting quality, installation simplicity and architectural integrity of design.

Patterned arrangement of Sunbeam DV7700 Series

Continuous rows of recessed H9040 Series with curved Controlenses®

Recessed "large area" HDP3800 Series with molded Plexiglas

SUNBEAM visionaire LIGHTING COMPANY

SUNBEAM LIGHTING COMPANY

777 E. 14TH PLACE • LOS ANGELES 21, CALIF.

*(R) Holophane Co., Inc.

FAST OR SLOW

...here's coordinated system protection without unnecessary interruption

MATTHEWS K&T Fuse Links

These NEMA Standard fast or slow Fuse Links have the uniform quality vital to proper coordination.

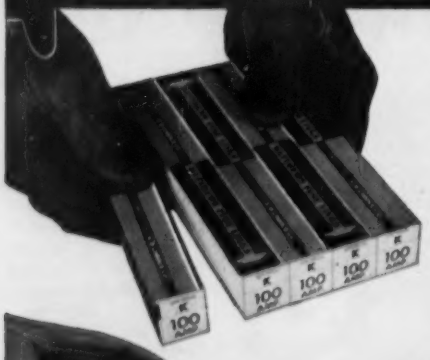
Auxiliary tubes are used on links through 100 amperes for positive circuit interruption of low fault currents. They also protect the fusible element from damage.

Low amperage links (20 amps and below) are fitted with a stainless steel push-out spring for added assurance of low fault current interruption.

Flexible cables are lead-coated for maximum resistance to corrosion.

Easy to use time-current curves are available to help you plan your coordination.

PACKAGED THE WAY YOU ASKED FOR THEM



An overwhelming majority of power companies, in response to a survey, asked for fuse links to be packaged and identified like this! Links rated 100 amperes and below are packaged in sturdy 5-link containers. Links over 100 amperes come in 3-link containers. Each of the joined packages is a container in itself. Perforation permits easy, immediate separation of each unit.

Lineman can easily pull out a link while wearing gloves. For convenience, five 5-unit containers (25 links) are packaged in a carton and three 3-unit containers (9 links) come in a carton. Everything, including the link, is clearly identified. Each link is stamped to show type and rating. Link type and rating is printed in big type on both ends of each single unit container. The large shelf package also clearly shows type, catalog number, rating and time-current characteristic curve numbers.

ABC INDUSTRIES

A·B·CHANCE CO·

CENTRALIA, MISSOURI

SAN FRANCISCO, CALIFORNIA

CF55-5

FACT: Corrosive atmosphere can't harm *Lifetime* meters

Corrosion can steal years of performance from your watthour meters . . . skyrocket maintenance costs. That's why Westinghouse gave its new Lifetime meters and sockets a corrosion-proof design which defies polluted atmosphere, salt vapor, heat, cold, dirt and moisture.

Aluminum, plastic, lacquer and enamel are used in conjunction with metal parts to help combat corrosion. All metal parts get protective treatments to keep them working smoothly, dependably.

For example, shafts and gears are gold finished. A chemical process is used to create a corrosion-resistant film on aluminum parts. This film actually becomes part of the metal, won't rub off or chip. Result: Westinghouse Lifetime meters run better, longer with less attention. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-40482

New Lifetime watthour meters

Type DA bottom-connected, type DS socket construction.

YOU CAN BE SURE...IF IT'S Westinghouse

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver

Here's where you get the answers to conduit problems

● Look under "The Youngstown Sheet and Tube Company" in one of these alphabetical or classified phone books.

They represent the 28 conveniently located district sales offices Youngstown maintains across the country. Offices staffed by men who understand your problems and who are qualified to help you get the conduit you need.

If you aren't in touch now with a distributor of Youngstown Buckeye Conduit, just call the Youngstown district office nearest you and they will help you solve your conduit problems.

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

5 Current Ratings in 1 Regulator

Vari-Amp Feature Now Available on Distribution Regulators

YOU GET MORE USES FROM A SINGLE REGULATOR now that Allis-Chalmers provides increases in current ratings of as much as 60%. The *Vari-Amp* feature provides convenient stops that limit the range to let you handle more load.

The *Vari-Amp* feature provides considerable flexibility. You can reduce ranges in 1¼% steps from ±10% down to ±5%, increasing current-carrying capacity in steps up to 160%. Range need not be equal in both directions. Set what you need — for example, 6½% raise at 135% current, 10% lower at 100% current.

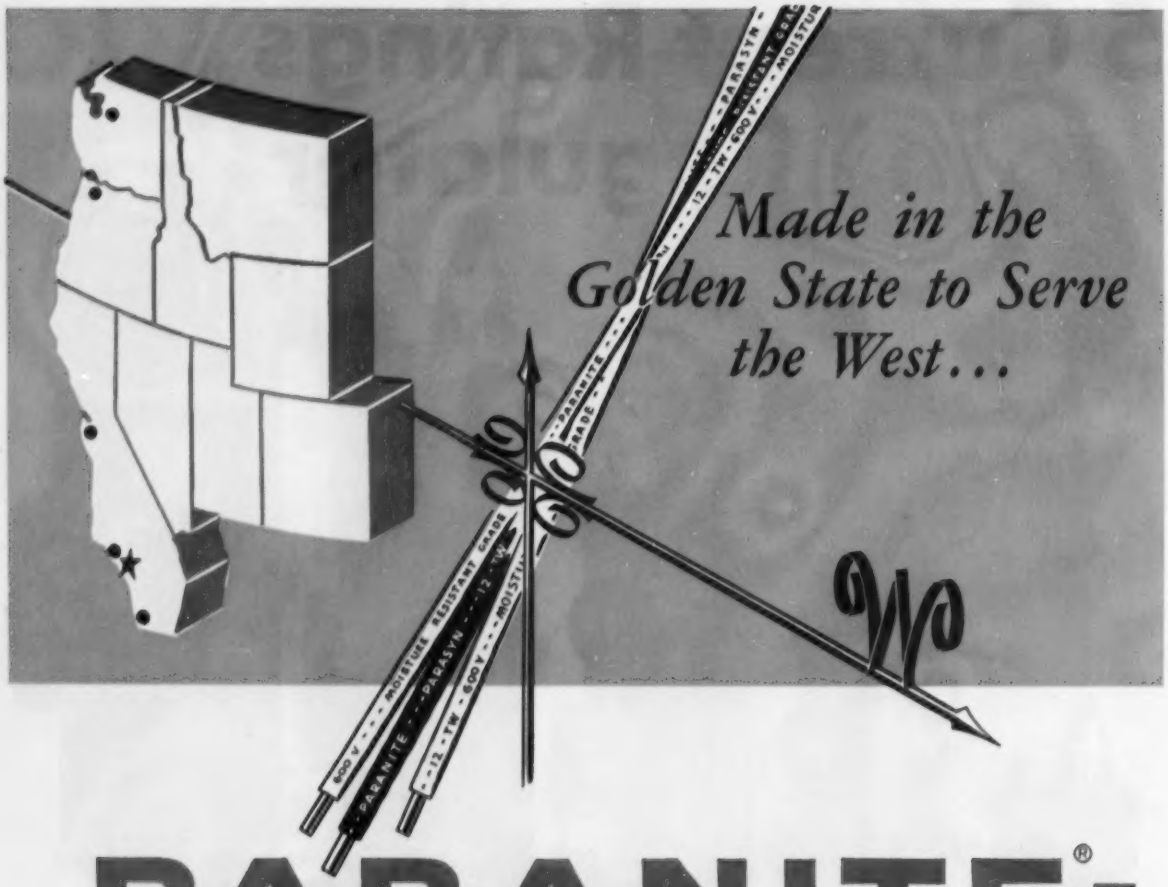
Best of all, this convenient feature that gives so many more uses for a voltage regulator comes at no extra cost. It gives you more for your regulator dollar because you get a lot more from a single regulator.

Get the complete story by calling your nearby A-C district office. Or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

A-4803

Originators of 5/8% Step Regulation

ALLIS-CHALMERS



PARANITE®-

PARASYN® TYPE TW SMALL DIAMETER BUILDING WIRE FLAME AND MOISTURE RESISTANT.....

● Paranite Parasyn is thermoplastic insulated and withstands exposure too severe for rubber insulated wires. UL approved for 60°C. Small size lets you add additional circuits in existing conduits or raceways...or use smaller sizes of conduit and fittings. Available in eight permanent colors for easy circuit identification. Sizes 14 to 1000MCM.

PARANITE WIRE AND CABLE

DIVISION ESSEX WIRE CORPORATION OF CALIFORNIA

Factory: Anaheim, California

WAREHOUSES* AND SALES OFFICES

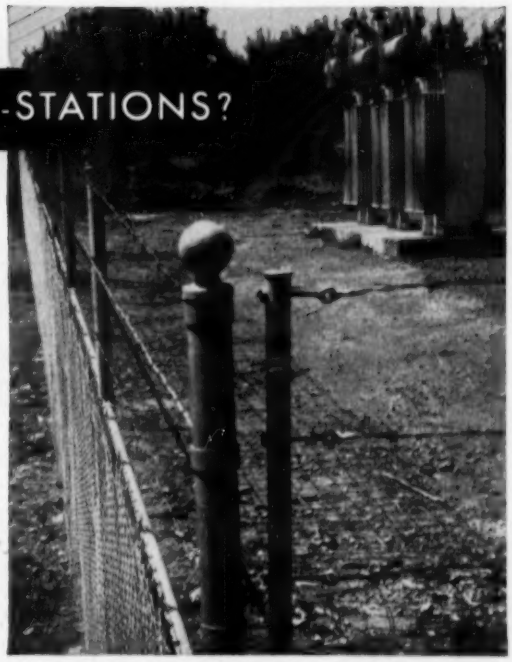
*LOS ANGELES
6415 East Fleet Street

*SAN FRANCISCO
1077 Howard Street

*PORTLAND
525 North Tillamook Street

SEATTLE
444 Dexter Horton Building

WEEDS AROUND SUB-STATIONS?



"Telvar" is ideal for weed control around fences, poles, towers. It's low in toxicity to humans and animals, non-volatile, non-flammable and non-corrosive to equipment.

One application of

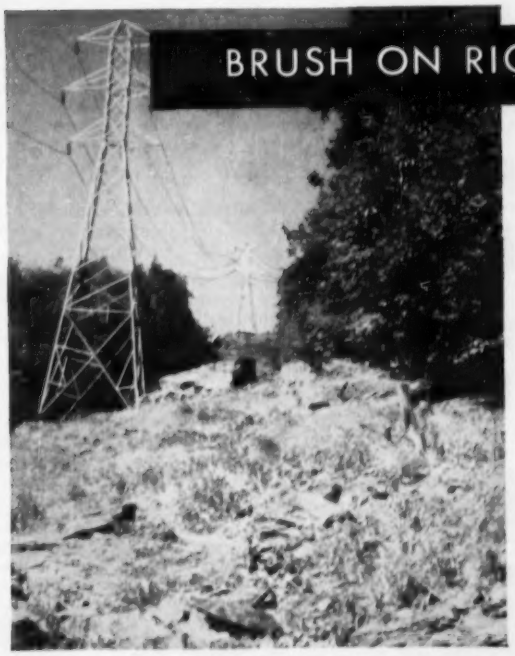
Du Pont Telvar®

WEED KILLERS

stops weeds for the season—or longer!

"Telvar" kills weeds through the roots . . . prevents regrowth. Low rates (20 to 80 lbs. per acre) make it cost little for the results you obtain . . . also mean less handling, fewer storage problems. To cut maintenance costs to new low levels, put "Telvar" in your weed-control program. Available in two formulations: "Telvar"W, and "Telvar" DW.

BRUSH ON RIGHT-OF-WAY?



"Ammate" applied five years ago, is still keeping brush down along this right-of-way. "Ammate" allows low-growing cover to return to resist erosion.

One application of

Du Pont Ammate X®

WEED AND BRUSH KILLER

kills more kinds of brush —safely—at lower cost!

"Ammate" X kills more kinds of brush and keeps it down longer than most weed and brush killers! When the original spray job is done well, brush is kept under control for years with only an occasional spot spray. You can rely on "Ammate" X to do the job safely, even where your right-of-way adjoins cropland, because "Ammate" X is not volatile. There are no vapors to drift onto sensitive crops. It is no hazard to crews, stock or wildlife.

FREE ILLUSTRATED BOOKLET (A-139) describes season-long weed control with "Telvar." Shows results in West Coast areas. For your copies, write to Du Pont, Grasselli Chemicals Dept., 111 Sutter St., San Francisco 4, Calif.

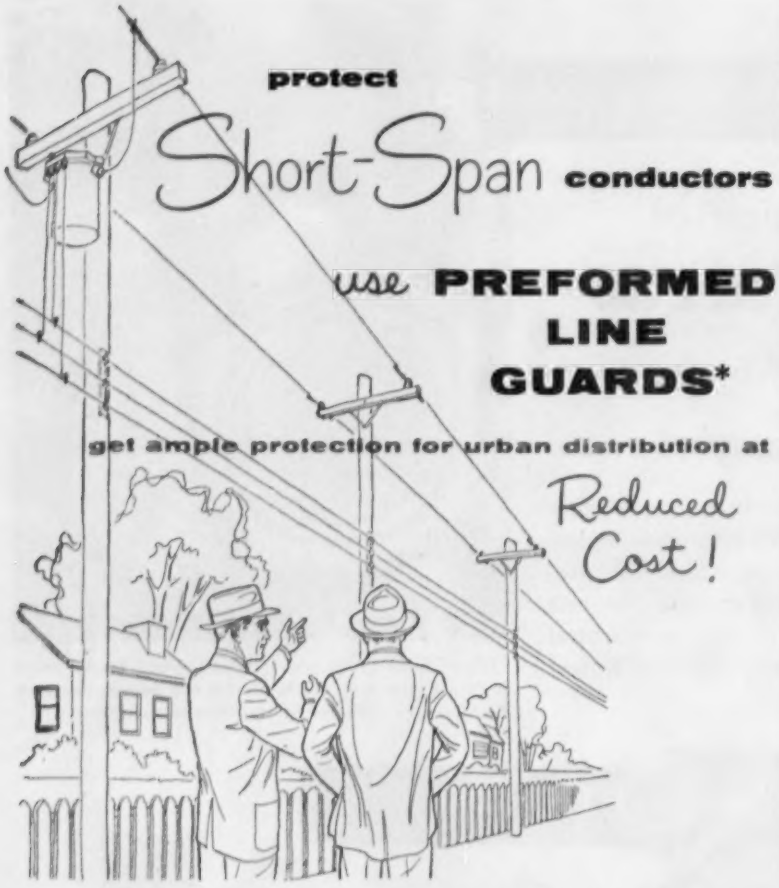
On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

Telvar® Weed Killers for industrial use

DU PONT REG. U. S. PAT. OFF.

Ammate X® Weed and Brush Killer

BETTER THINGS FOR BETTER LIVING.. *THROUGH CHEMISTRY*



• Preformed Line Guards will save money on short-span urban distribution lines . . . whether ACSR, all-aluminum, or copper conductors are in use. Use them on all conductors where protection against vibration damage is not essential and standard Armor Rods may not be needed. Line Guards are smaller in diameter—fit insulator grooves of both old and new designs. Check P L P price lists. You will notice Line Guards are *lower* in price than Armor Rods . . . yet, Line Guards provide sufficient protection on short spans.

Line Guards . . . developed from Armor Rods—are used like Armor Rods . . . protecting conductors against arcover, chafing, and mechanical wear due to concentrated stresses on light or short-span construction.

Let your P L P Representative help you select the most economical P L P Product for your application. Write or call Cleveland: EX 1-3571.

**Made in accordance with or for use under one or more of the following U. S. Patents: 2,275,019; 2,587,521; 2,609,653; 2,691,865; other patents pending.*

Pin Insulator
Line Guards should be used over the conductor where the wires are applied . . . guard against tie-wire damage.
Line Post
Line Guards permit you to apply your ties as tightly as needed without fear of conductor damage.
Clamp Type
Line Guards fit snugly . . . cushion the conductor from clamp-pressure damage and concentrated stresses.

PREFORMED LINE PRODUCTS CO.
5349 St. Clair Avenue
Cleveland 3, Ohio

ELECTRICAL BOOKS

THE LINEMAN'S HANDBOOK, *790 pages, 6x9, by E. B. Kurtz, McGraw-Hill Book Co. Inc., $10.*

All steps in locating, erecting, testing, inspecting and maintaining electrical transmission and distribution lines are described in detail in this book. More than 1,000 illustrations are effectively used. This is a thoroughly revised edition of the book, with revisions adding about 50% more to the contents.

NEMA STANDARDS FOR MOLDED-CASE CIRCUIT BREAKERS, *National Electrical Manufacturers Assn., $1.75.*

Ratings, testing and manufacturing information about air circuit breakers, single pole and multipole, assembled as an integral unit, are contained in this publication. Deals with circuit breakers with current ratings up to and including 600 amp in frames not exceeding that rating; for voltages up to and including 600 v a-c, 250 v d-c, and with interrupting capacities of more than 1,000 amp.

A POCKETBOOK OF SPEECH FORMULAS, *36 pages, 6x9, by Lester Lyle McCrery, National Safety Council, $.60 to members; $1.20 to nonmembers.*

This publication is a new training aid for foremen and other supervisors who are required to give safety or employee education talks. This compact manual includes the details of speech organization, preparation and delivery, and even how to win over a hostile audience.

SOIL WARMING BY ELECTRICITY, *116 pages, 6x9, by R. H. Coombes, Philosophical Library, $4.75.*

Materials and methods for soil warming, as well as a section devoted to crops that are adaptable to this type of growing, are included in this illustrated book. The book originated in Great Britain and general information is of that locale.

MAGNETIC MATERIALS IN THE ELECTRICAL INDUSTRY, *288 pages, 6x9, by P. R. Bardell, MacDonald & Co. Ltd., London, $10.*

The relation of modern magnetic qualities of materials to the design of systems in which they are utilized is emphasized in this book. Usable for research and teaching. An extensive list of definitions of words and symbols is included for the student. Theoretical considerations are dealt with in the opening portion of the book, with applications following.

LINEAR FEEDBACK ANALYSIS, *by J. G. Thomason, 355 pages, 6x9, McGraw-Hill Book Co., $8.50.*

An analytical background for science graduates working in electronics or servomechanism research is provided in this book. The main concern is the stability of the feed-back loop, and causes of instability are discussed using three different methods of approach. Illustrative designs are used.

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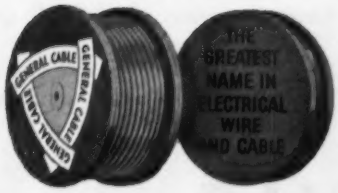

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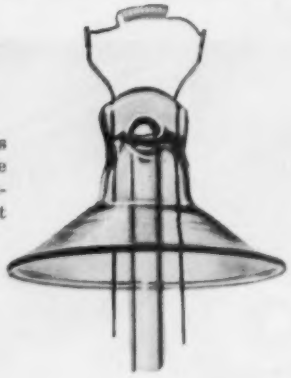

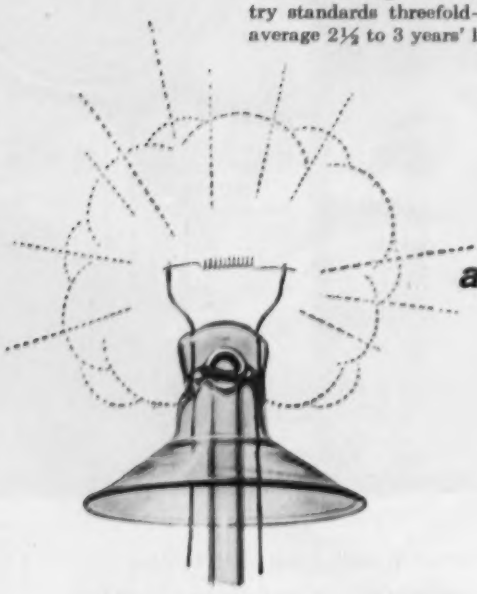

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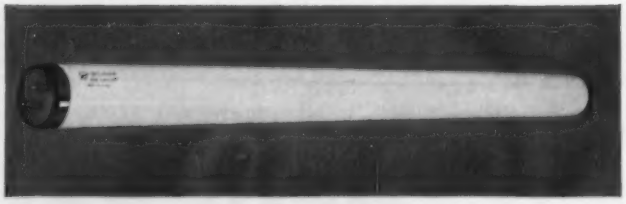

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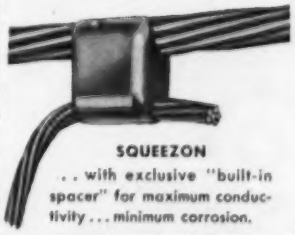

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To safeguard today's construction, you need the tight-gripping strength and high conductivity of KEARNEY Sleeves and Squeezons.

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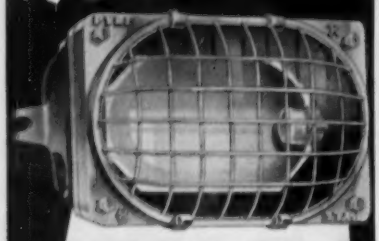

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Another NEW addition to The Pyle-National Company's extensive line of industrial floodlights and lighting fixtures!

The Pit Light is especially designed to provide perfect lighting in maintenance pits, subways, tunnels, washracks, or other locations subjected to heavy moisture. Heavy-duty metal construction throughout, fixture can be recessed in, or surface mounted on either wall or ceiling.

Reflector can be pivoted to adjust the angle of beam upward or downward from center. Easily cleaned, heat and impact-resistant plain glass front reduces reflection losses. Reversible, hinged heavy wire guard — held closed by spring latches — is optional.

Write for Bulletin

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LETTERS TO THE EDITOR

What is Responsible?

To the Editor:

Repeatedly, the technical press, the newspapers and various professional groups call attention to the increasingly small number of students who graduate into the engineering and scientific professions. There is, in spite of increasing college enrollments, a serious lack of interest and eventual participation in these creative fields. Even a superficial study of college registrations reveals the overwhelming popularity of the essentially noncreative areas of business, economics and law. In addition, a larger number of students are taking refuge in the dead-end areas of equipment maintenance, sales forces and clerking.

What are the factors responsible for this disheartening, even foreboding lack of student interest in the creative, highly skilled professions?

Primarily responsible is a basic socioeconomic attitude of contemporary society, a debilitating security-from-cradle-to-grave mentality which emphasizes the paternalistic responsibility of society to the individual, rather than the contributive responsibility of the individual to society. Creative thinking, which is as vital a part of the engineering and scientific processes as it is of the artistic, does not function to capacity in an atmosphere characterized by the passivity and negativism derived from an emphasis on security, on "just making a living," on guaranteed wages, on a comfortable retirement. Initiated by the federal government during the 1930s when faith in individual initiative reached its lowest ebb, the process has been dangerously accelerated by organized labor, which offers to trade human dignity for bovine security. Virtual guaranteed employment to inefficient personnel, the discouragement of intrafactory competition and technical superiority, the frustration of voluntary extra participation in the functions of management, and the drive to standardization and conformity effect an irresistible lure to the large number of apathetics who would rather be given one dollar than attempt to make five.

In this respect, the technical, business and consumer press has not sufficiently employed its editorial oportunities to demonstrate the fallacy inherent in "guaranteed security." Every measure of security is purchased with an equal measure of freedom; government insurance implies government interference; union security eventuates in union dictatorship.

Second, the contemporary educational organization is failing in its responsibility to its students and to the society which supports it. The emphases on nondirective methods, which are too often nondirectional; on general education, which achieves generally a slipshod familiarity with the salient aspects of many areas of activity, and an efficacious knowledge of none; on liberal education, which, being too liberal, lacks the discipline which makes for genuine education; on simplified curriculums which assure constant movement of its bloated student bodies; these emphases, in sum, create students without the discipline, the dedication and the talents necessary for the highly specialized professions. Its student-products can, perhaps, repair, but not design; use, but not invent; sell, but not discover.

The military organization which has responsibilities to the community during times of peace, as well as during war, neglects its opportunities to channel its technically trained personnel into allied civilian occupations. Considering that the majority of our young men are at one time or another members of the armed forces, it would well profit those areas of industry in need of electrical and construction engineers, and scientists, to effect a kind of public relations liaison with parallel military units, interesting eventual civilians in opportunities available upon discharge. There is little doubt that from the guided missile and electronic branches of the artillery school, for instance, many electrical engineering candidates could be successfully wooed.

As the deepening sea of governmental control and labor "organization" threatens to inundate us, and more of us either succumb to its temptations or resign to its ills, there is increasingly less we can do, and more that must be done, if what has been built by human beings believing in their own dignity is not to be destroyed. While the opportunity remains, spokesmen for the creative professions should study the organization of the nation's schools, play a more vital propaganda and public relations role on its campuses and infiltrate its directing components. Future engineers and scientists are now in our schools; it is, apparently, up to agencies outside the schools to determine whether we will benefit from students with talents and skills in these fields or be plagued by students with degrees in "general" education, seeking a "guaranteed" wage.

MICHAEL J. KIRLIN
San Francisco

Of Interest

To the Editor:

We read with interest the article called "School Costs Can Be Cut" on pp 90 and 91 of the August issue of ELECTRICAL WEST.

We believe this article would be of interest to school administrators, architects and electrical engineers in the San Diego area. We would like to ask permission to have reproduced 100 copies of the article for mailing to this particular group.

C. M. THOMPSON
Engineer-in-Charge of
Commercial Lighting Sales
San Diego Gas & Electric Co.

Complete Report

To the Editor:

At the recent directors' meeting, President Sam Scott commented upon ELECTRICAL WEST's very complete report of the last annual convention and in the discussion that followed it was pointed out that this was characteristic of the splendid coverage of all of the association's activities.

By formal motion, I was instructed to express the appreciation of the association to you and your staff for this fine cooperation and I can assure you that it gives me real personal pleasure to convey these sentiments to you.

VICTOR W. HARTLEY
Managing Director
Pacific Coast Electrical Assn.
Los Angeles, Calif.

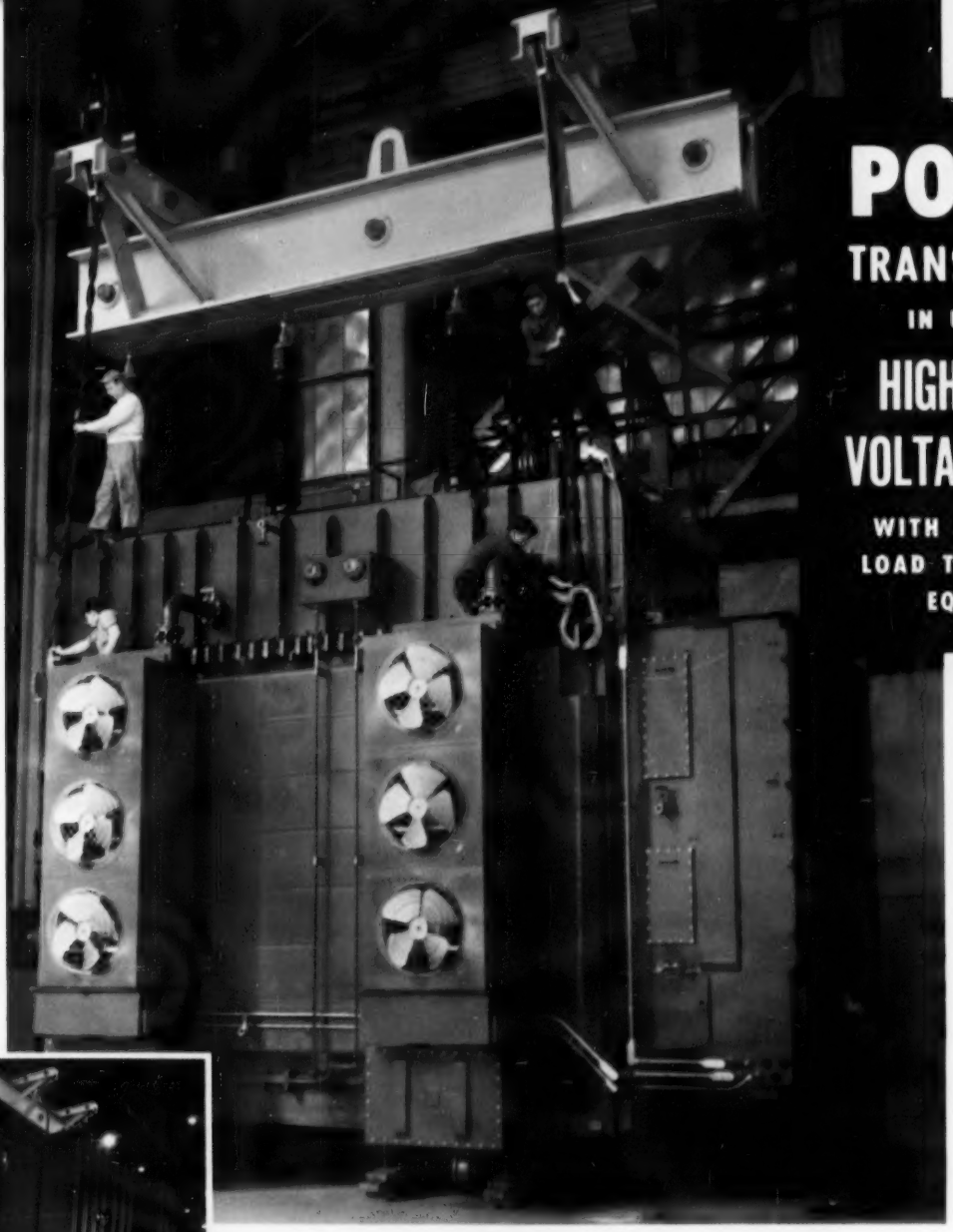
Bulletin No. PT2805-455

POWER TRANSFORMERS

IN UNLIMITED

HIGH KVA and VOLTAGE RATING

WITH OR WITHOUT LOAD TAP CHANGING EQUIPMENT



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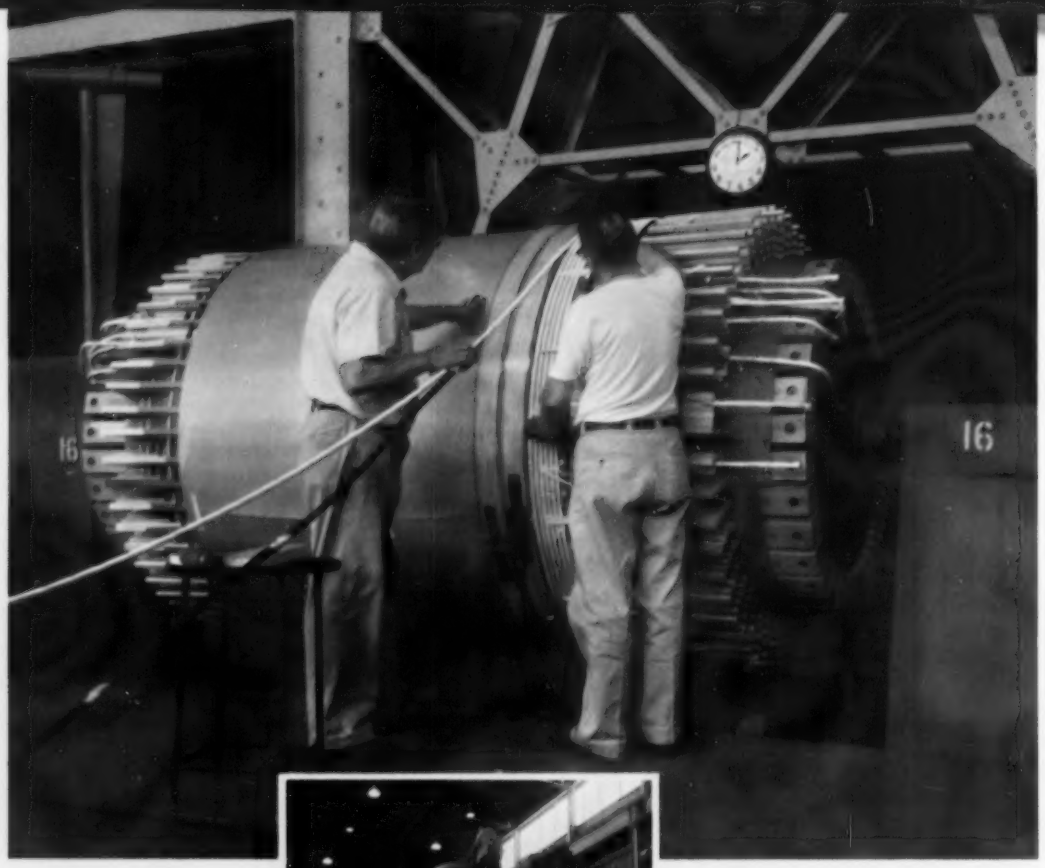
FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA



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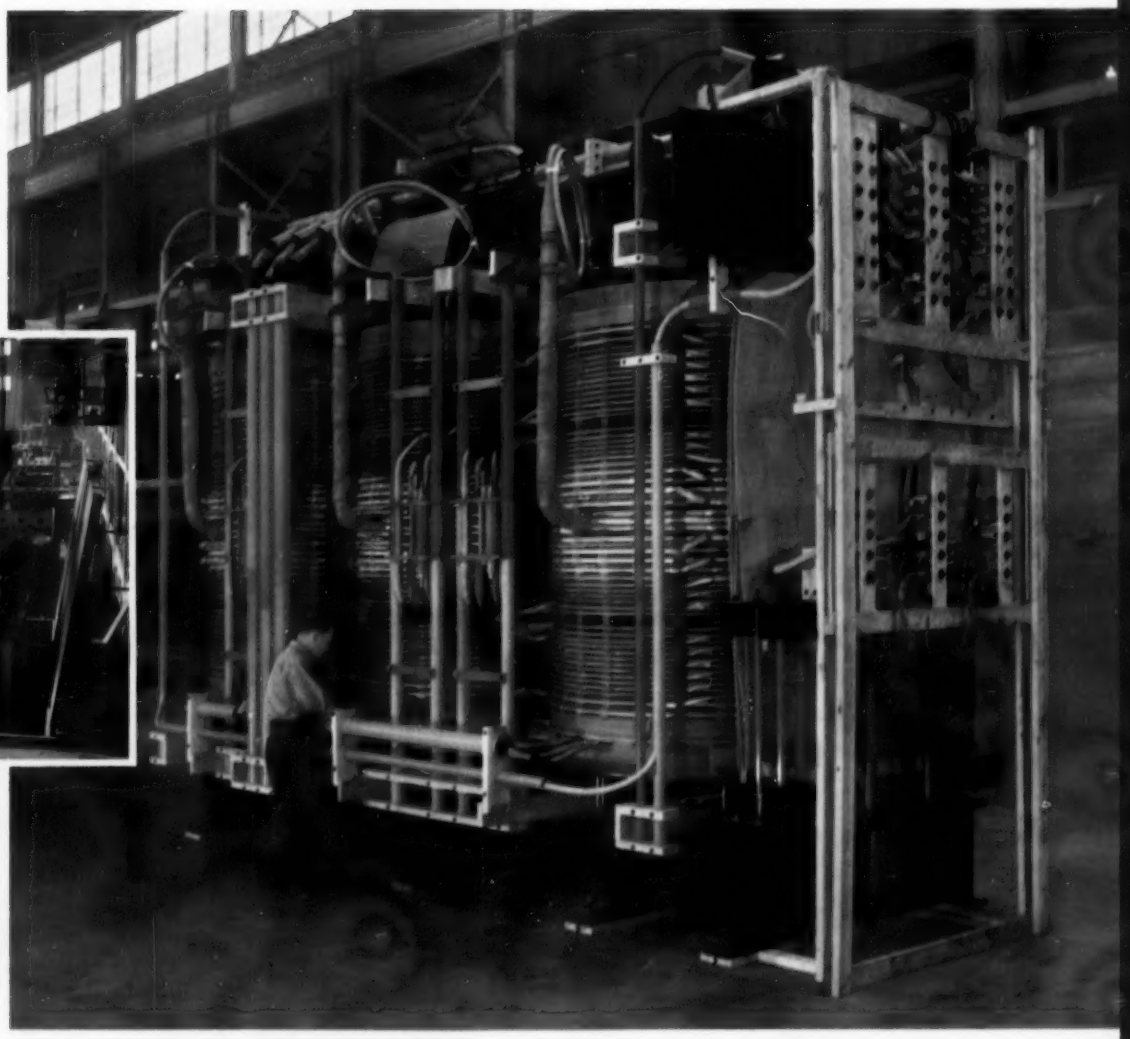
To best serve your system's needs and to offer dependability in operation and long, trouble-free operating life for an indefinitely long period.



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TESTED
DEPENDABILITY
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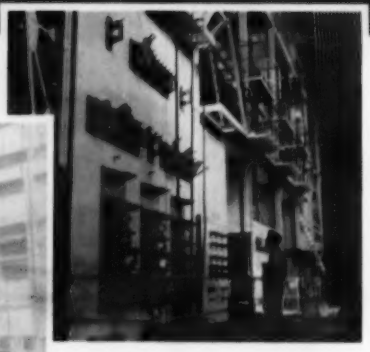

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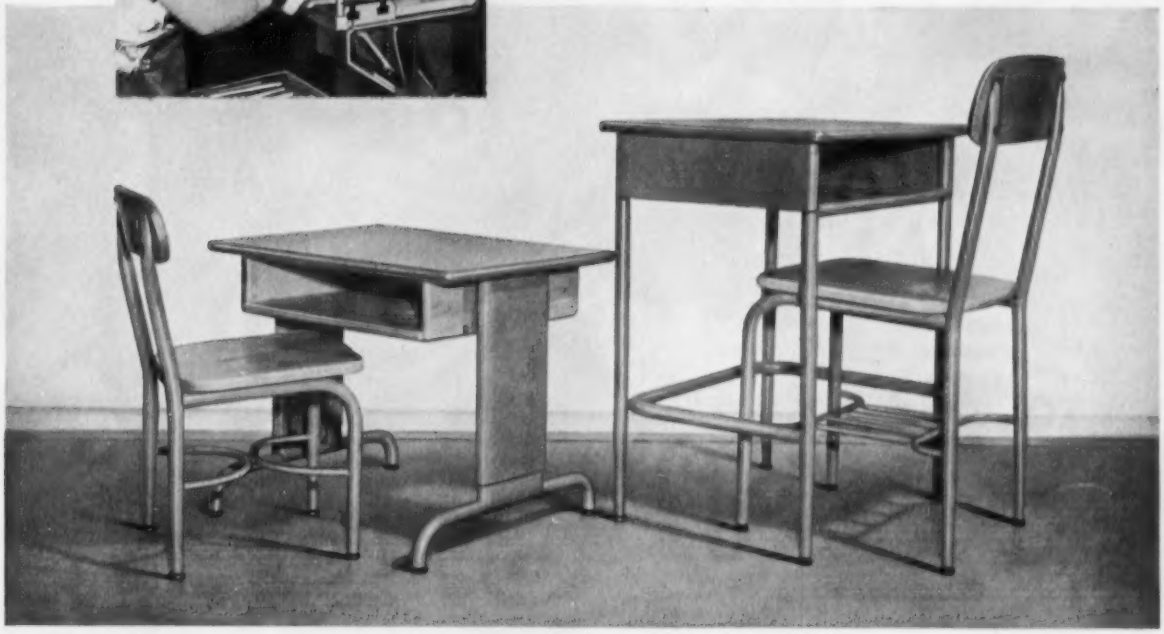
FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

Early in the Virco production line, end sections and legs for steel furniture (like the student desk and chair combinations, below) are "flash welded".



Whether or not you make school furniture—

You can save money with the one right steel!

School furniture so light that even children can handle it with ease—and it's made of *steel!* Virco Mfg. Corporation uses 18 gauge cold rolled coils from USS for fabricating tubular legs and supporting struts on their widely-known school desks, chairs and tables. These hollow steel members are the key to Virco's light but steel-strong furniture.

This Los Angeles manufacturer asked USS Metallurgists for help in selecting a steel that would readily accept the seam welding needed to close tubular members. By studying the end use of Virco's steel, Columbia-Geneva's technical people were able to recommend and produce the grade of steel that would meet Virco's requirements.

Steel produced in this manner, *for a specific purpose,* shows up in the high quality of your finished products and reduced rejects on your production line. Evaluating your requirements and translating them into steel is our business. Isn't there some place in your plant where the one right steel could be saving you money? One call to Columbia-Geneva could be the answer to your problems.

Free!

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COLUMBIA-GENEVA STEEL DIVISION
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SAN FRANCISCO 6, CALIFORNIA

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NETWORK
TRANSFORMERS
for fast, easy positioning

NEW SUSPENSION MOUNTING

reduces positioning time for G-E network transformers to minutes instead of hours

A new design idea—suspension mounting—now greatly simplifies installation and maintenance of network transformers.

Developed jointly by General Electric and Consolidated Edison Company of New York, suspension mounting enables you to position a transformer in a fraction of the time formerly required. Vault floors need not be level. Furthermore, your construction men can quickly level the transformer since it is much easier to shim an I-beam cross bar before hanging a transformer from it than to shim a transformer after placing it on a vault floor. The Consolidated Edison men placed their first unit in position and levelled it in less than 10 minutes!

MAINTENANCE IS SIMPLIFIED, TOO

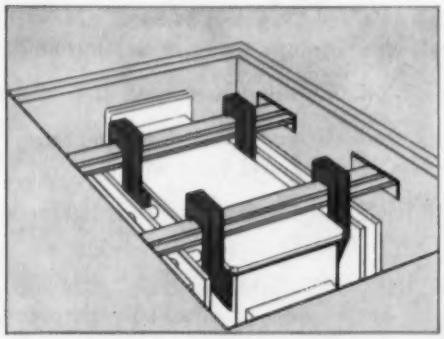
With suspension mounting, the transformer is 8 to 10 inches above the floor of the vault, away from corrosive elements such as sewage, dirt, and chemicals, which collect in most vaults. This retards corrosion of the tank, making it necessary to clean the vault far less frequently than when the transformer is set on the floor. When cleaning becomes necessary, it's easy to flush out the vault because there is clear passage under the transformer.

It's also easy to clean and repaint the transformer. Radiators are of the panel type, with large flat surfaces easily accessible from the top or ends. Just use a long-handled brush or nozzle.

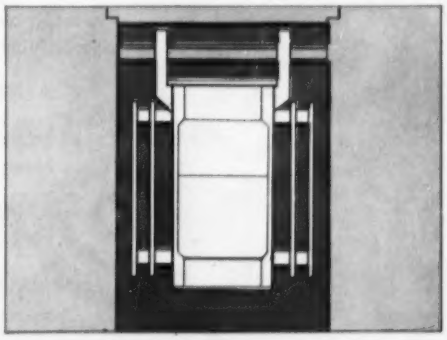
Maintenance is simplified in other ways, too. You can remove bushings, for example, from the outside of the tank. There are no large gaskets to replace. Accessories are located on the high-voltage end of the transformer where you can easily reach them. It's easy to inspect the network protector because it slides out on rails.

HELP FOR YOU

For help in solving your network problems and for complete information on the advantages of suspension-mounted G-E network transformers, see your local G-E sales representative. General Electric, Schenectady 5, N. Y. 4154



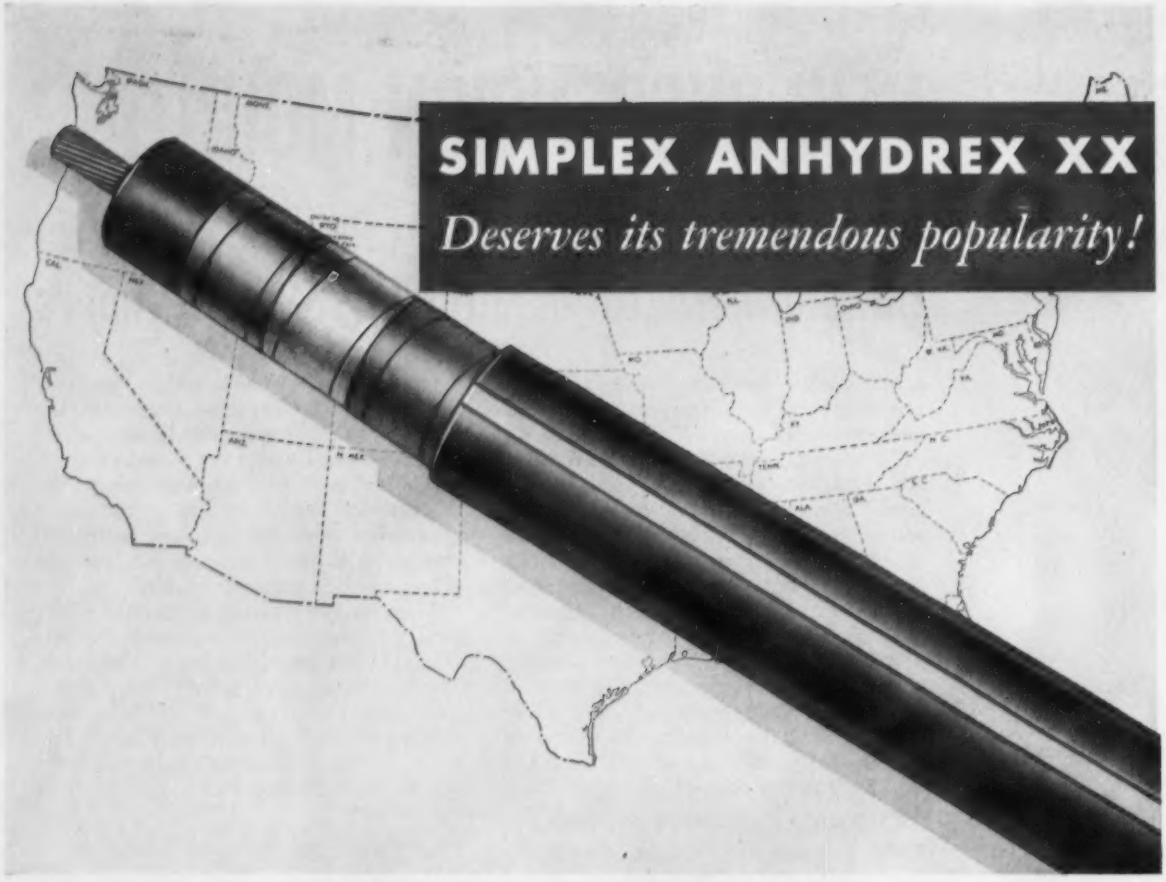
SUSPENSION MOUNTING. Two sturdy hooks rest on I-beams installed above transformer. Each beam rests on bearing plate in side-wall recess.



PLENTY OF SPACE under transformer keeps it above chemicals and debris, retarding corrosion and permitting fast and easy cleaning of vault.

Progress Is Our Most Important Product

GENERAL ELECTRIC



- Simplex-ANHYDREX XX insulation is made for cable operating at 3kv to 25kv and over.
- It resists heat, ozone, oxidation and water even AFTER *aging for 7 days at 250°F.*
- Rated at 85°C. to 15kv and at 80°C. above that, it's used in ducts, overhead on messenger wires, or underground.
- ANHYDREX XX eliminates need of a lead sheath.
- It eliminates problems of oil migration, sheath creeping, corrosion, electrolysis, bonding and joint wiping.
- ANHYDREX XX-insulated cable is lighter and more flexible than lead-covered cable.
- ANHYDREX XX Cable is made with a tough neoprene jacket, submarine armor wire, or other suitable outer covering.

Simplex Bulletin 1009A tells more about ANHYDREX XX high voltage insulation. Write for it today.

Simplex **ANHYDREX XX CABLE**

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.

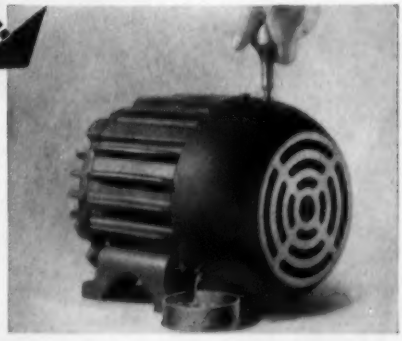
Get Both bearing features

fully enclosed and protected

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

. . . yet easy to grease



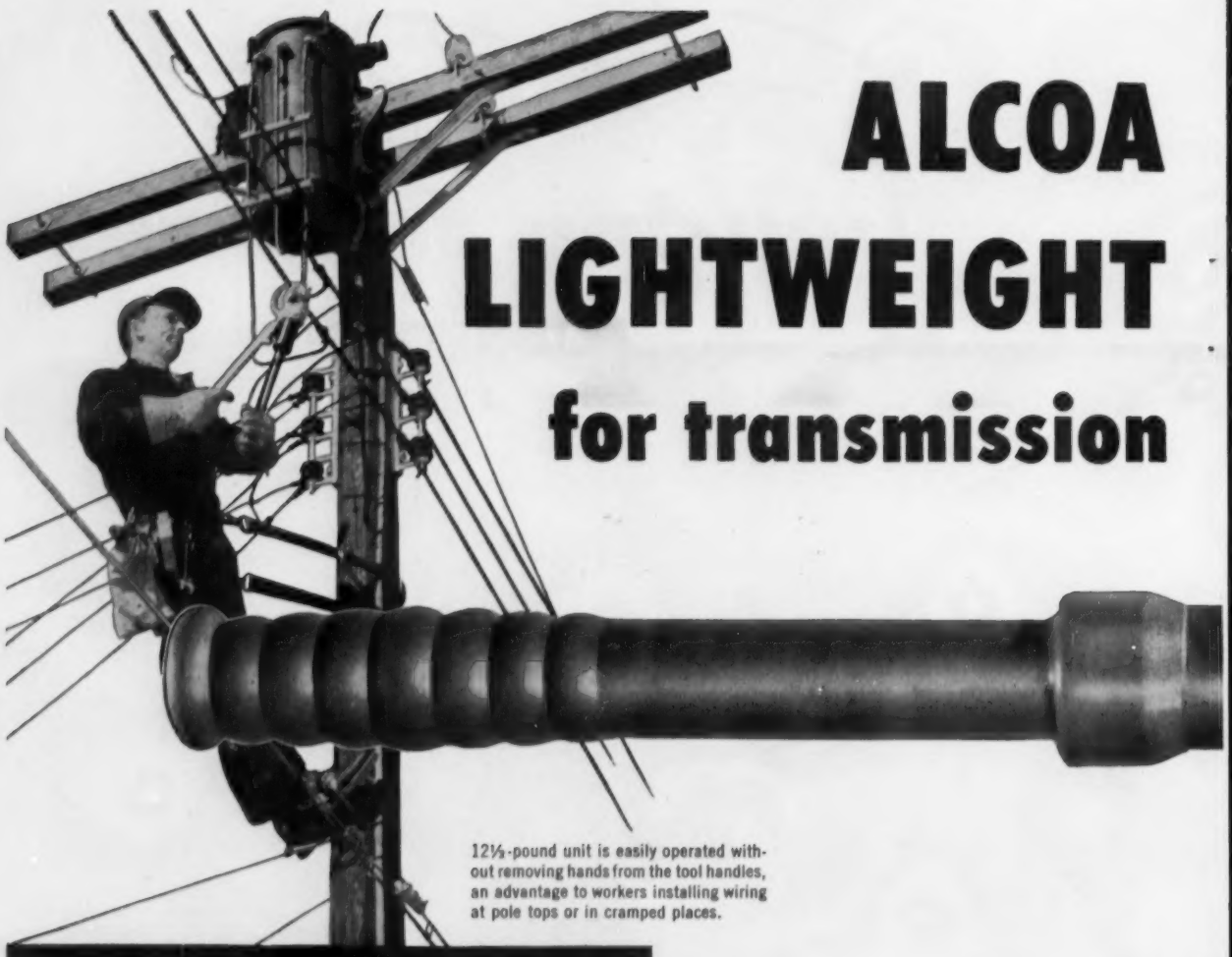
You can lubricate the bearings without dismantling the motor. Pipe-tapped holes in the bearing housings at three points provide both means for inserting new grease and a means of flushing out old grease.

Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to show you a cutaway section of this maintenance-cutting design. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7225.

A-4609

ALLIS-CHALMERS

ALCOA LIGHTWEIGHT for transmission



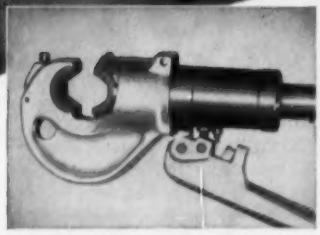
12½-pound unit is easily operated without removing hands from the tool handles, an advantage to workers installing wiring at pole tops or in cramped places.

Latest addition to most complete line of aluminum conductors and accessories continues Alcoa's leadership in the field!

Model 12A compressor has 12-ton thrust for use on ACSR and aluminum conductors as large as 397,500 cm.

OFFERS VERSATILE 12-TON COMPRESSOR

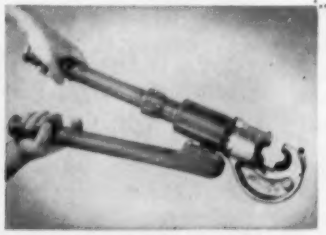
and distribution line fittings



C-head holds dies, can be rotated 180° to facilitate easy operation by lineman in limited working space. Hand line may be easily attached to compressor.

Die opening is quickly closed by simple twist of one handle. Minimum effort completes compression stroke. Pressure release trigger, located at grip, automatically retracts dies.

Identical half dies are held in place by tool's head so compressor can be moved along the compression fitting without shifting of dies.



Other features are nylon pump packing, integral pressure relief valve. Normally supplied with neoprene covered body and handles, compressor may be adapted to "hot-stick" work.

Aluminum Company of America
2314-K Alcoa Bldg., Mellon Square
Pittsburgh 19, Pa.

Please send copy of your Fact Folder on Alcoa Model 12A Compressor.

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Your guide to aluminum value

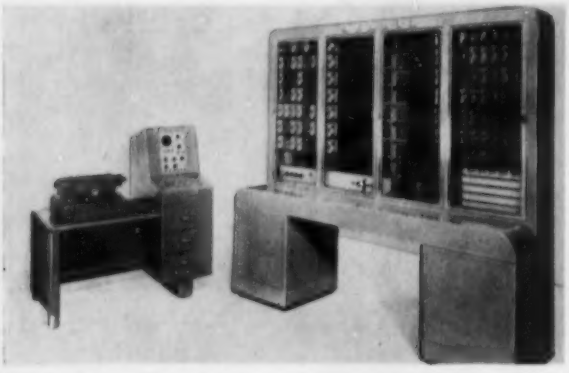
ELECTRICAL CONDUCTOR MADE OF
ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

PRODUCT NEWS

Subway-Type Transformer

(1) Pennsylvania Transformer Co., Box 330, Canonsburg, Pa.

Low over-all height, easily maintained tank, suspension mounting and quiet operation are stated features of this new subway-type 500-kva, 13-kv, three-phase network transformer. It is stated that there is no place on the tank that cannot be reached for complete inspection or cleaning. The transformer tank is 50 in. high.



Electronic Computer

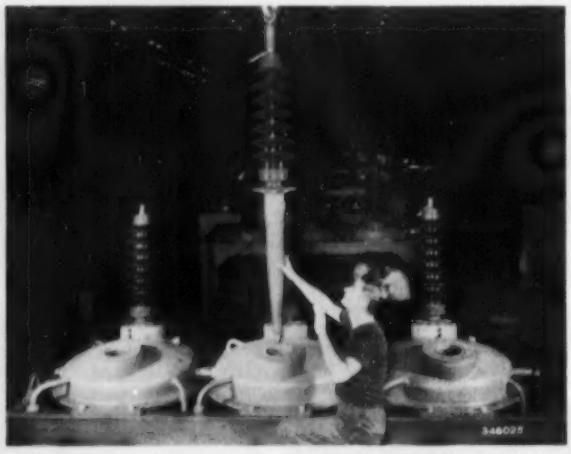
(2) J. B. Rea Co. Inc., 1723 Cloverfield Blvd., Santa Monica, Calif.

This computer, called the Readix, is a medium-speed low-cost computer said to be designed to meet the requirements of business data processing, automatic systems and scientific computation. Instructions and data can be fed into the machine by means of electric typewriters, punched paper tape, magnetic tape or IBM cards, according to the manufacturer. Output is in the form of punched tape, magnetic tape or punched cards that can in turn be used for operation of automatic production and process control equipment, it is stated. The machine is said to have a 4,000-word internal memory.

Service Drop Cable

(3) Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland 12, Calif.

A new triplex electrical conductor with an aluminum alloy neutral, combining the light weight of EC aluminum with the strength of ACSR, is announced by this company. The self-supporting service drop cable is said to have corrosion resistance approaching that of EC aluminum, but with a superior fatigue limit. Based on 500,000,000 cycles, the fatigue limit is 16,000 psi, the manufacturer reports. Ordinary fittings can be used with the new cable.



Condenser Bushings

(4) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

A new line of condenser bushings in voltage classes and dimensions standardized by NEMA and ASA is available from this manufacturer. The bushings are primarily for application on circuit breakers and power transformers. All are supplied with power factor test terminals in the mounting flange. Using these terminals, the bushing power factor can be measured by the ungrounded-specimen method in the field without removing or disconnecting the bushing from the transformer winding or removing the breaker grids.

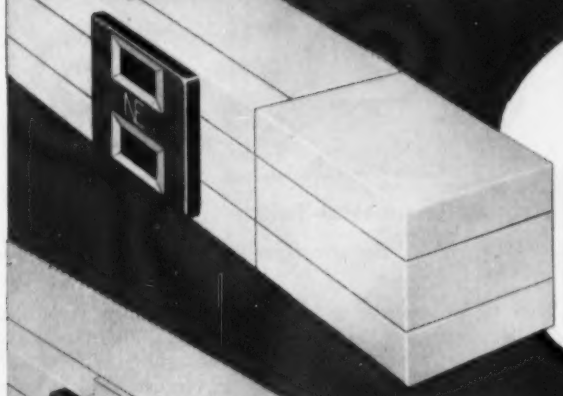
Switching Surge Test

(5) Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

This manufacturer has announced the availability of a completely new test for power transformers 115-kv and higher switching surge strength. The company's engineers report that the new test provides a means of proving the transformer's ability to withstand switching surges, therefore allowing safe selection of lower strength transformers when used with newly improved lightning arresters.

Plenty of outlets...FAST

WITH NATIONAL ELECTRIC "PLUG-IN" STRIP



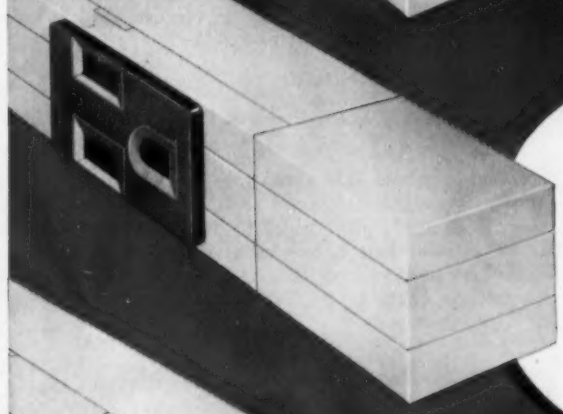
TYPE CF-2

"PLUG-IN" STRIP

FOR CONSTANT SERVICE

Constant Service 2-wire type CF-2 "Plug-in" Strip has been a standard of the electrical industry for many years. This steel enclosed pre-wired multi-outlet assembly is ideal for applications where a spread of outlets is required to provide safe, dependable, convenient electric service.

Available with outlets spaced every 6 or 18 inches.



TYPE CF-2G

"PLUG-IN" STRIP

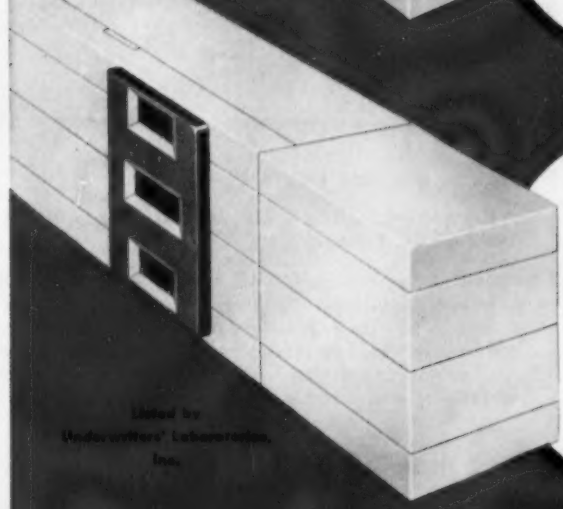
FOR GROUNDING AND SAFETY REQUIREMENTS

Type CF2-G "*Plug-in*" Strip provides a spread of convenient receptacles for the use of grounded equipment.

The dual-service receptacle accommodates either grounded or ungrounded equipment.

The grounding insert of each receptacle is positively secured to the all-steel raceway providing a continuous metallic ground the entire length of the "Plug-in" Strip.

Available with outlets spaced every 6 or 18 inches.



TYPE CF-3

"PLUG-IN" STRIP

FOR WALL SWITCH CONTROLLED SERVICE

National Electric's 3-wire "Plug-in" Strip provides full switch-controlled residential service with a minimum of switch leg wiring. Two distinct electrical services are provided in each receptacle. Every receptacle has both switch-controlled and constant service features...

A choice of service every 18 inches.

Listed by Underwriters' Laboratories, Inc.

NATIONAL ELECTRIC PRODUCTS CORP. PITTSBURGH, PA. 50th ANNIVERSARY 1905—1955

National Electric Products

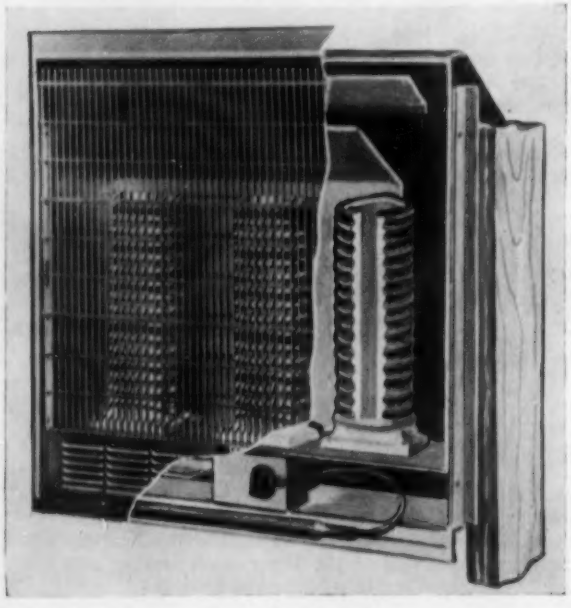
TORRANCE, CALIFORNIA

Branch Offices: San Francisco • Seattle • Denver • Los Angeles
Salt Lake City • Portland • Phoenix

Baseboard Heater

(6) Westinghouse Electric Corp., 410 Bush St., San Francisco 8, Calif.

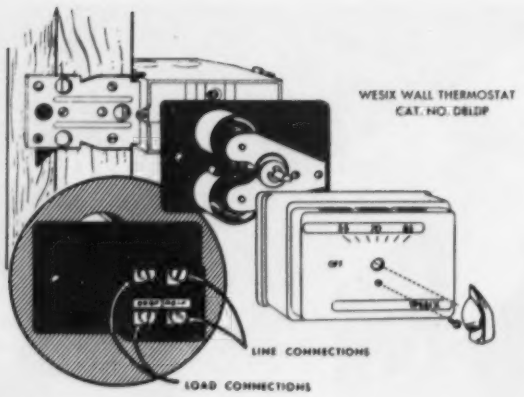
This manufacturer is introducing an electric baseboard heater that is reported to be economical to install, operate and maintain. Units are installed against the wall in place of baseboards, and are in 2-ft sections. Each room temperature is regulated separately from a central control panel. Requires 240-v circuits.



Wall-Unit Space Heaters

(7) Ceilheat Inc., 5212 Homberg Dr., Knoxville, Tenn.

Specially compounded ceramic cones supporting nichrome heating coils are of a modified delta shape in this company's wall-unit space heater. The manufacturer states that this reduces the amount of heat trapped within the heater. Thermostat bulb is exposed to room air through louvers at the bottom. Produced in 11 models from 1,000 to 4,000 w capacity.



Heating Thermostat-Switch

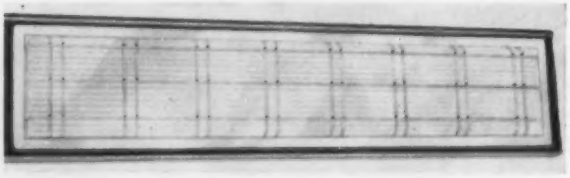
(8) Wesix Electric Heater Co., 390 First St., San Francisco, Calif.

Said to be sensitive to a temperature change of plus or minus one degree, this company's DBL-DP thermostat and switch is rated at 25 amp, 240 v, with a range of 55 to 85°. Designed for use with virtually all electric heating units.

Ceiling Radiant Heater

(9) Markel Electric Products Inc. and LaSalle Products Inc., Buffalo 3, N. Y.

Thermal overload safety control, silent fan and "Even Heat" distribution are stated features of this new ceiling radiant heater. Manufactured to fit quickly and easily in between 16-in. joist centers and splice to regular house wire. The heating unit is prewired and self-contained. Available in 1,000- and 1,250-w sizes.



Infraglass Radiant Heaters

(10) Infraglass Heater Co. Inc., Dept. 220, 350 S. Sanford St., Pontiac, Mich.

This manufacturer has standard and de luxe models of portable and panel radiant heaters, each featuring Infraglass, and a full line of standard Infraglass baseboard radiant heaters. Baseboard heaters available in 1,050 and 1,550 w capacities; wall panels in four models ranging from 800 to 1,050 w, and portables in 1,000 w capacity.

Radiant Heat Cables

(11) Electromode Corp., 45 Crouch St., Rochester, N. Y.

Electric radiant heating cable suitable for installation in either ceilings or floors is announced by this company. Available in capacities of 300 w to 4,600 w. The manufacturer states that a special plastic jacket is responsible for the wide range of applications. The cable also has a nylon outer jacket to prevent chemical reaction with the plaster.

Why tie up your money in communications equipment?

When you let the Bell System furnish your communications, you enjoy three important advantages:

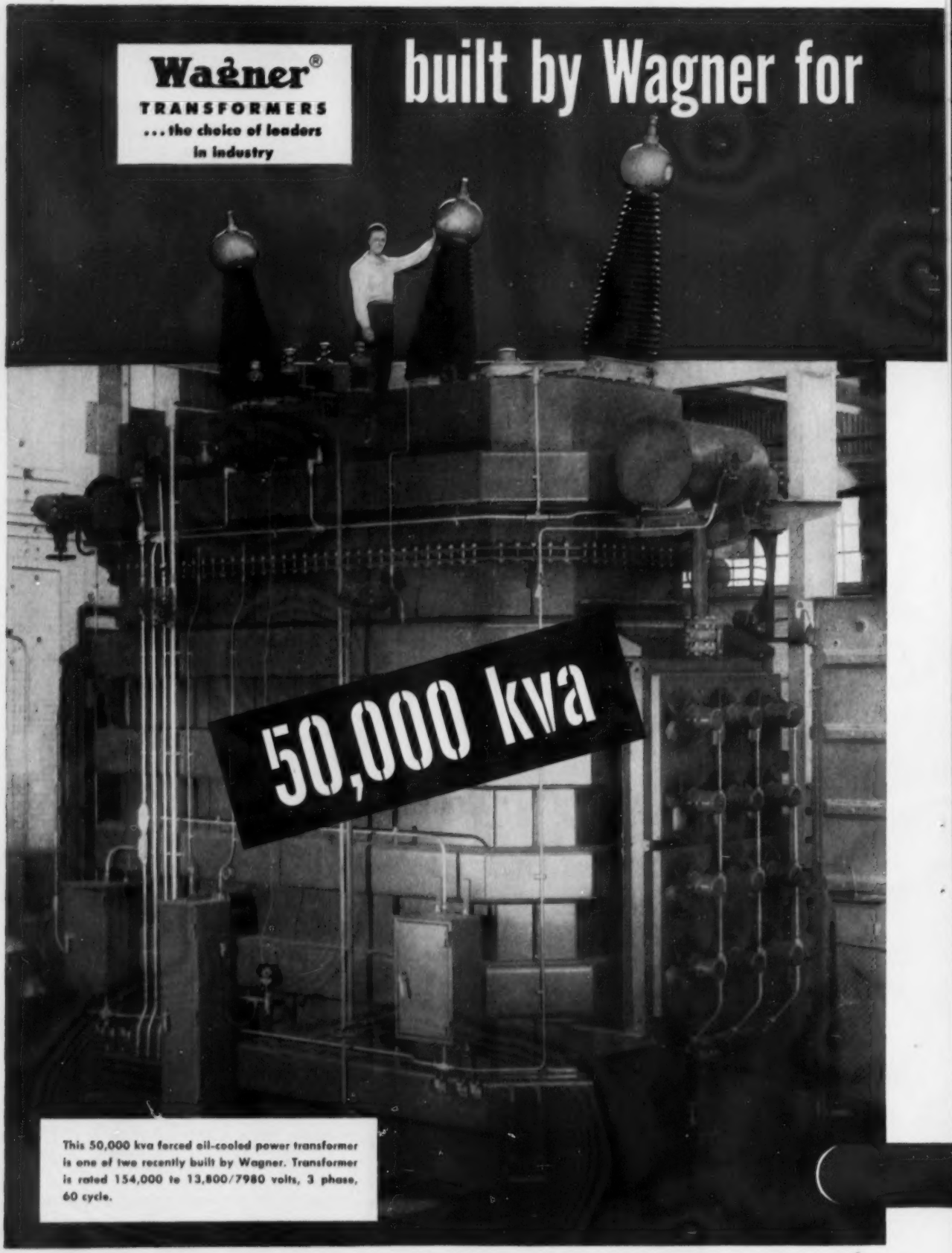
1. *You avoid a large capital investment.*
2. *You don't have to worry about maintenance and obsolescence.*
3. *You get the benefits of trained personnel, expert supervision, continuing analysis.*

You don't tie up your money in communications equipment when you use Bell System facilities. This means you free this money to produce income.

A Bell System communications engineer will be glad to survey your communication needs. His study and recommendations are yours without cost or obligation. Call your Bell Telephone representative.

BELL TELEPHONE SYSTEM

TELEPHONE TELETYPEWRITER MOBILE RADIO TELEMETERING AND REMOTE CONTROL CHANNELS


Wagner®
TRANSFORMERS
...the choice of leaders
in industry
built by Wagner for
50,000 kva
This 50,000 kva forced oil-cooled power transformer is one of two recently built by Wagner. Transformer is rated 154,000 to 13,800/7980 volts, 3 phase, 60 cycle.

a large Southern Industrial plant

What do you want in a power transformer?

Wagner can build it!

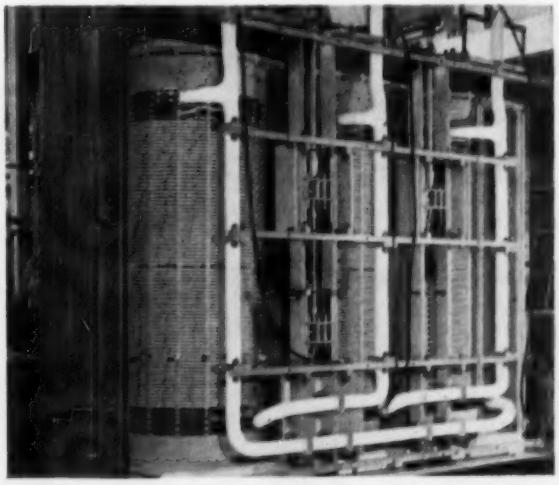
This 50,000 kva power transformer, recently completed at the Wagner transformer plant, is an example of the kind of fine power transformer building that Wagner can offer you.

Wagner has all of the manufacturing facilities and years of experience necessary to build power transformers in the ratings required for modern power systems.

Wagner has been serving the electrical industry for over sixty years. Users like the way that Wagner transformers are designed and the care with which they are built. Wagner design and construction is the reason for the strength and stability of these transformers—gives them the capacity to unfailingly carry their rated loads, and to be able to handle overloads whenever necessary.

Why not consider Wagner Transformers for your next installation? 32 branch offices are available for convenient consultation and engineering service. Bulletins TU-180 and TU-181 give full information on Wagner Transformers. They're yours for the asking.

Every step in the construction of a Wagner Power Transformer gets very special attention. Here, workmen are completing the core for the power transformer shown on the opposite page.



Here is the completed core and coil assembly for this 50,000 kva transformer. These elements are carefully designed and built to fully withstand the electrical and mechanical stresses they will meet in service.

Wagner Electric Corporation EST. 1891

WAGNER ELECTRIC CORPORATION
6381 Plymouth Ave. • St. Louis 14, Mo., U. S. A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

T55-12

ARREST
POWER "WASTE"

Install
OHIO
MOTOR AND GENERATOR BRUSHES

Positive performing OHIO BRUSHES readily put a stop to improper, inefficient performance. "POWER WASTE" is industries' Public Enemy No. 1.

West Coast Representative
C. F. BOWERS
544 S. San Pedro St.
Los Angeles 13, Cal.

THE OHIO CARBON CO.
12508 BEREA ROAD
CLEVELAND 11, OHIO

Aerial Platform

(12) Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City, Mo.

Full maneuverability at heights of 65 ft is possible with this company's latest aerial boom. Has a rated capacity of 500 lb, any radius, any boom position. Boom rotates 360° on a turntable that also carries the independent power source and 1,600-lb counterweight. Stability is provided by front and rear outriggers.

Regulation Adjustment

(13) Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee, Wis.

The "Vari-Amp" feature of this manufacturer's regulators is now a feature of all single- and three-phase step regulators, giving them five steps over which current capacity can be increased by reducing the range of regulation. It is reported that adjustments can be made in only a few minutes in the field, allowing any regulator to be used at various places in the system.

Baseboard Heaters

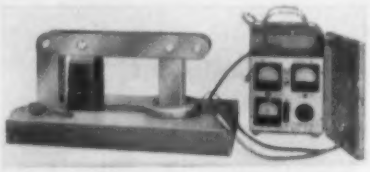
(14) Berko Electric Mfg. Corp., 212-40 Jamaica Ave., Queens Village, N. Y.

The principal of radiant glass electric heating is incorporated into this baseboard unit. Can be used to heat an entire house or single room, as required, or for supplemental heating. Panel is 2½ in. deep, and is installed in place of baseboards.

Range and Power Outlets

(15) Circle F Mfg. Co., Trenton, N. J.

Patented swing-away terminals simplify the use of this new range and power outlet, according to the manufacturer. The clamping plate on the new terminals swings out of the wiring groove after a single screw is loosened, it is reported. Receptacle has back plate knockouts for ¾-, 1- and 1¼-in. conduit, with built-in cable clamp for back or bottom wiring, and with mounting screws.



Coil Tester

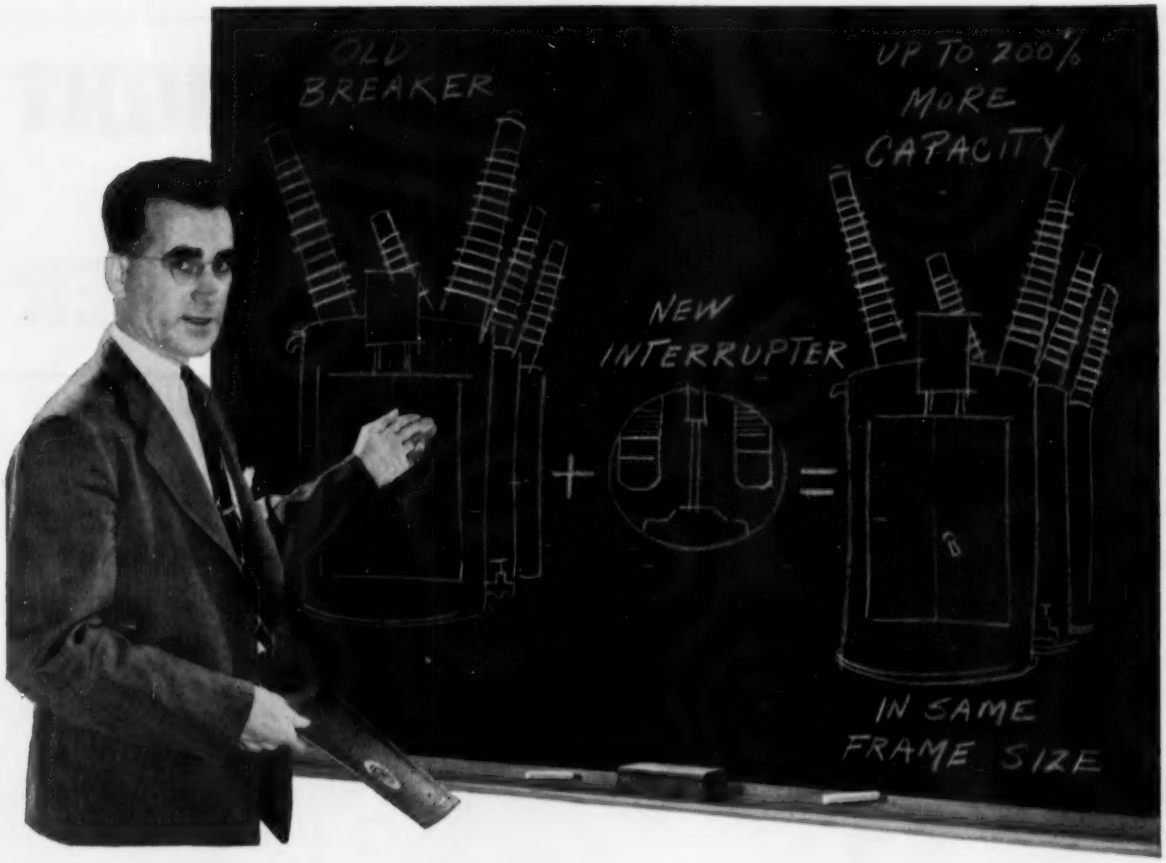
(16) Martindale Electric Co., 1306 Hird Ave., Cleveland 7, Ohio

This new instrument is designed for testing field coils, armature coils, transformer coils, solenoids, etc., according to the manufacturer. Will detect shorts on one or more turns, detects opens and shows number of turns in a coil from 10 to more than 3,000, it is reported. Minimum coil opening 2⅝x3 in. or 3⅞ diameter. Maximum coil height 6 in. Operates on 115-v, 60-cycle a-c.

Snap-Around Ammeters

(17) Pyramid Instrument Corp., 630 Merrick Rd., Lynbrook, N. Y.

Three new models have been added to this company's line of snap-around ammeters. Available in 0-125/250-v models in current ranges of either 0-1, 0-25, 0-50 and 0-100 amp a-c and in 0-150/600-v models in current ranges of either 0-25, 0-50 or 0-100 amp a-c. The manufacturer states that the model 300 is the best for general all-around work.



Meet load growth, lick costs with unique breaker Modernization Plan

The shortest distance between old breakers and new breakers is the Westinghouse Modernization Plan. The plan is simple and costs approximately one-third the price of completely new equipment, installed.

This is how it works. You tell us the style and rating of your present breakers. We will provide you with a new interrupter and contact assembly for the Westinghouse O, G, GO or GM frame-mounted or floor-mounted breakers. Install the interrupters yourself; neither tanks nor foundations need be disturbed. The result? Rejuvenated breakers . . . additional capacity of anywhere from 50% to 200%, and added breaker life of up to 15 years.

Interrupters furnished are, of course, the exclusive Westinghouse magnetic De-ion® or multi-flow De-ion grid types which offer you standards of performance your present equipment can no longer provide.

Have your Westinghouse sales engineer give you final details of this quick and inexpensive breaker Modernization Plan, or write to Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa. J-60882

YOU CAN BE SURE...IF IT'S

Westinghouse

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver

FLORIDA POWER & LIGHT SELECTS S&C POWER

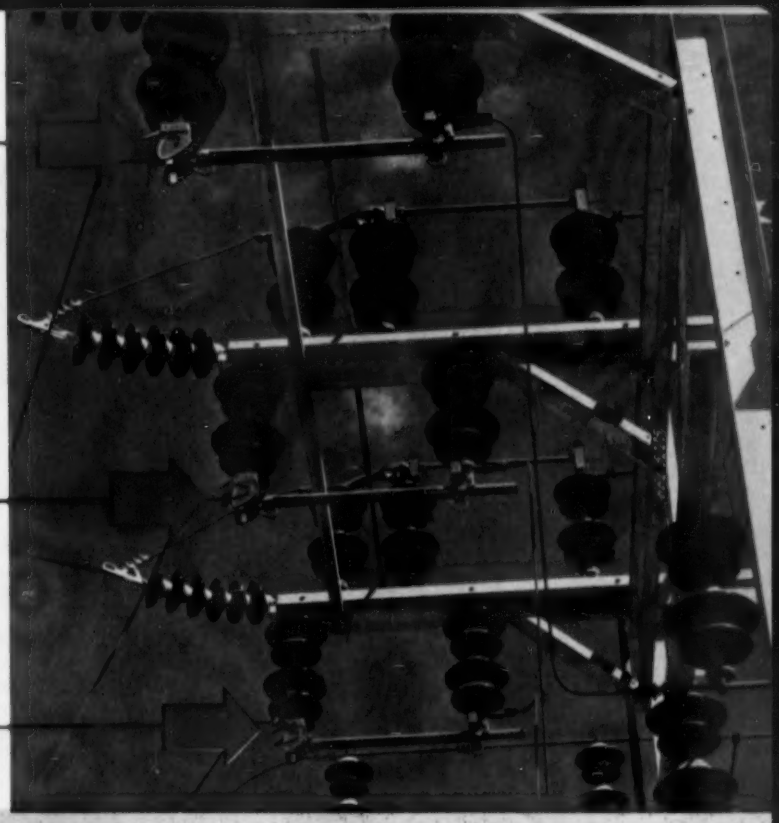
Florida Power & Light Company is the Sunshine State's fastest growing utility. Year after year more manufacturers, more businesses, and more commercial enterprises are moving into the territory it serves. Rapid population gains have increased customers by 138%, and more than tripled demands on the Florida Power & Light system since the end of World War II.

To satisfy these demands, Florida Power & Light has carried on an extensive power expansion program which, by the end of 1955, will have required the investment of $250,000,000 since V-J Day.

For an expansion program of such importance, it is only natural that the greatest possible care is used to make sure that service continuity is maintained and system equipment is protected.

Aerial view of the Hialeah section of Miami—one of the areas where rapid building of homes and industry has increased demand for light and power to six times what it was ten years ago. Hialeah Park is nationally famous . . . open the year around . . . host to hundreds of thousands annually.

COMPANY FUSES



For example, S&C Drop-Out Power Fuses—Type SMD (marked by arrows, right) are installed at Hialeah substation to protect two 7500 kva 69/13 kv transformers which serve Hialeah Park as well as the hundreds of homes and many small industrial plants which surround it.

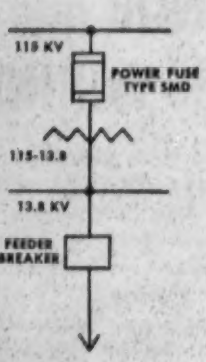
How S&C Power Fuses Are Used in the 69 Kv and 115 Kv System Protection Schemes

The transmission lines of Florida Power & Light Company are tapped at intervals to feed distribution substations. As was originally planned, the power transformers were not always provided with primary protection against secondary faults since primary breakers could not be economically justified.

After a 115 kv power transformer had been lost (for lack of such protection) the matter of protection was reconsidered. It was then decided that this protection was essential and that the device selected must meet these special requirements.

1. Provide system protection over a wide range of fault currents.
2. Coordinate with the transformer damage curve to provide maximum protection to the transformers.
3. Give complete coordination with secondary protective devices over the full range of fault currents.
4. Be capable of withstanding the recovery voltages which might be encountered under various fault conditions.
5. Be low in cost.

S&C Power Fuses, Type SMD, were found to meet all these requirements. Further details of Florida Power & Light's application of these fuses may be found in AIEE Paper No. DP 55-405.



Typical substation tapped directly from Florida Power & Light's transmission lines.

Specialists in High-Voltage Circuit Interruption since 1910

S&C ELECTRIC COMPANY

4425 RAVENSWOOD AVENUE • CHICAGO 40, ILLINOIS, U. S. A.

In Canada: S&C Electric Canada, Ltd., 8 Vansco Road, Toronto 14, Ontario

POWER FUSES • DISTRIBUTION CUTOUTS AND FUSE LINKS • LOAD INTERRUPTERS • METALCLAD SWITCHGEAR

is

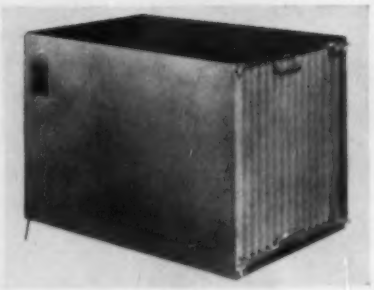
KNOB and TUBE WIRING

Adequate wiring—as recognized nationally—represents plenty of convenience outlets and controls, properly located — and backed by large capacity electrical wire.

Any size electrical wire will carry *more current* with *Knob and Tube* wiring! Surprised? Most people are. Check the facts! Tables I and II of the National Electrical Code provide complete comparisons. You get 33% to more than 100% *extra capacity* with *Knob and Tube* wiring—the *first* approved wiring method in NEC. Still the best. Still unchallenged!

Specify Knobs and Tubes by Porcelain Products—synonymous with reliability for 61 years.

61 years ELECTRICAL PORCELAIN SINCE 1894 PP INC.
Porcelain Products, Inc.
FINDLAY, OHIO



Dust Collector

(18) Suttle Equipment Co., 135 LaSalle St., Chicago 3, Ill.

Called Dust-Sorb, this new product is said to be capable of removing particles one-millionth of an inch in size from the air. It is time-switch operated and self-contained. The time switch permits automatic operation for any part of an hour. Size is 24x24x36 in. Operates on 110 v a-c. Recommended by the manufacturer for rooms containing a concentration of electrical equipment.

Hydraulic Bender

(19) Greenlee Tool Co., Rockford, Ill.

An aluminum alloy is said to make this new pipe and tube bender lightweight without sacrificing durability. The two-speed hydraulic pump and bending ram are in separate sections linked with a 6-ft section of high-pressure hose. Designed to use a wide selection of the company's bending dies. It is said to develop a bending pressure of 15 tons.

Nonreturnable Reels

(20) Rome Cable Corp., Rome, N. Y.

Some Rome Cable products are now shipped on nonreturnable reels, which is said to reduce accounting and handling expense for customers, since it permits a "no deposit—no return" system. Use is limited to building wire, rubber and neoprene power cables and certain service cables at the present time.

Convector Heating

(21) Baldwin-Rice Corp., 10 High St., Boston, Mass.

Wattages of 450, 750 and 1,000 that can be plugged into any outlet fused for 15 amp are available in this company's convector heaters. Two larger sizes require 20-amp fusing. Units contain a liquid, not water, eliminating filling or draining maintenance.

Insulating Head Gear

(22) E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif.

The new Bullard KV is reported to give protection against both impact from falling or flying objects and electric shock and burn, as outlined by EEI specifications of April 1, 1954. The plastic helmet has no metal or holes in the shell, and weighs less than 14 oz complete with nonconducting elastic chin strap, the company reports. Available in white or yellow molded-in color, and identified by a lightning symbol on front.

Contact Burnisher

(23) ADRE Co., Box 38, Hales Corner, Wis.

A new pocket-size contact burnisher has been introduced by this company. Fitted in a pen-type case, the burnishing element is said to have a mild, controlled abrasive action. The case handle is said to be insulated against shock.

Distribution Transformers

(24) Marcus Transformer Co., Rahway, N. J.

Lower weight and higher efficiency are stated features of a new series of oil-filled transformers announced by this manufacturer. Available through 167 kva.

Tap Changers

(25) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

A new tap changer for step regulators rated above 1,500 kva changes taps under load on a regulating transformer to provide plus or minus 10% regulation in ⅝% steps. Switching equipment is in two separate oil-filled compartments, one for selector switches and one for transfer switches. The tap changer is completely self-contained.

High-Voltage Lamp

(26) General Electric Lamp Division, Nela Park, Cleveland 12, Ohio.

Industrial plants with high bays, dust and dirt problems have the situations for which this new 750-w lamp using an R-52 bulb was designed. For use with 230-250-v electrical systems. The manufacturer states that it has a 2,000-hour life.

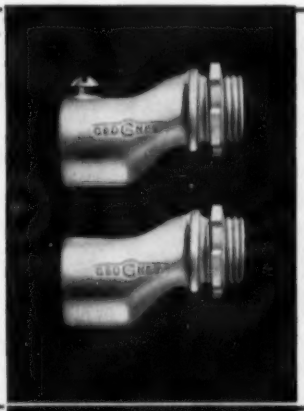
For more data fill in coupon on page 64

FOR ROCK-BOTTOM INSTALLATION COSTS

SPECIFY GEDNEY!

GEDNEY FITTINGS are machined and threaded with utmost accuracy... smooth-finished, with no metal particles or burrs... made of malleable iron to eliminate breakage... individually inspected to ensure absolutely top quality. That's why they're quickest, least costly to install... Specify Gedney Fittings and you'll find, like thousands of others, that this is the most profitable line available today!

Gedney 90° Pull-In Ells and Adapters with Neoprene gasketed cover and self-retaining screws. These fittings may be used to convert a straight box connector into a 90° connector, or as a 90° box connector for rigid standard pipe coupling. Ells have female threads at both ends. Adapters have male threads at one end and female at the other. Made of malleable iron and cadmium plated. Sizes ½" to 2".



Gedney Offset Connectors—eliminate the necessity for offsetting conduit at knockout entrances of standard boxes. Threaded for rigid, set screw for EMT. Made of malleable iron, cadmium plated, in sizes from ½" to 2".

Gedney Corner Pull-In Elbows are outstanding for space saving, machine wiring, easy wire pulling. Malleable iron, cadmium plated. Made in ½", ¾", 1", 1¼", 1½" and 2" sizes.

Gedney Offset Coupling—female both ends—for use as an offset between boxes. Can also be used with conduit nipple (Gedney 7-50 series) to give more room in box than otherwise possible.
Gedney Offset Nipple, male both ends.

Both of these fittings are made of malleable iron, cadmium plated. Available in sizes from ½" to 2".

GEDNEY FITTINGS FIT

GEDNEY
ELECTRIC COMPANY

GEDNEY

RKO BLDG. • RADIO CITY • NEW YORK 20
Foundry, Factory and Shipping Point: Terryville, Conn.

BECAUSE...

BERKO IS PREFERRED BY CONTRACTORS AND CONSUMERS, too!

BERKO is a quality line . . . the industry leader, well-known for finest design and performance.

BECAUSE...

BERKO SOLVES THE WHOLESALER'S BIGGEST HEADACHE...

by offering a product with top Brand Identity, one which can be sold, and handled by the trade at a fair profit.

BECAUSE...

BERKO STAYS AHEAD OF THE ELECTRIC HEATING INDUSTRY,

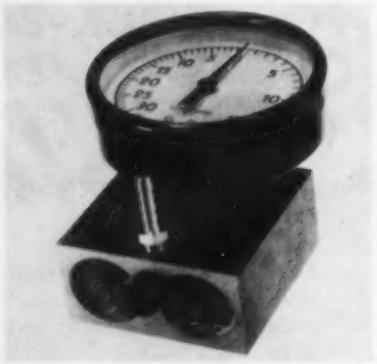
with promotion and new products presented when they do *you* the most good. Check the two fine new products shown below, offered just at the right time for you to profit during the big Fall heating season!

PROFIT THIS FALL
with these two new BERKO Products . . . the 1500-watt Model THC (left) (also comes without thermostat), and the BB240 Baseboard line (below) . . . the ultimate in home heating!

Be one of the alert wholesalers who have learned how profitable it is to feature BERKO. Write today to:

BERKO ELECTRIC MFG. CORP. DEPT. EW 10—212-40 Jamaica Ave., Queens Village 28, N. Y.

BERKO GLASS ELECTRIC RADIANT HEATING



Transformer Breather Valve

(27) James-Pond-Clark, 2181 E. Foothill Blvd., Pasadena 8, Calif.

ASA standards for control of temperature-induced pressure changes in oil-filled power transformers are met with the design of this breather valve, the manufacturer reports. It is made of solid brass and is said to be usable externally without additional protection. It is essentially two relief valves and a sampling valve.

Sealed-Beam Flood Lamp

(28) General Electric Lamp Division, Nela Park, Cleveland 12, Ohio.

Development of a new 200-w PAR-46 flood lamp with a side-prong base is announced by this manufacturer. Reported to produce a narrow to medium distribution of light. Designed for indoor or outdoor use, with thermal shockproof glass.

Insulator Selector

(29) Locke Department, General Electric Co., Box 57, Baltimore 3, Md.

An easy to use circular slide chart for determining mechanical and electrical characteristics of cap- and pin-type insulator stacks for given operating voltages and basic impulse insulation levels is available from this manufacturer.

(30) **LADDER LEVELER**—Ladr-Levl is a patented set of self-adjusting legs that attach to ladders for safe leveling. Contact H-B Industries Inc., 1401 Middle Harbor Rd., Oakland, Calif.

(31) **VOLTMETER**—Identified as model 101, this lightweight portable instrument plugs into a standard 115-v electrical outlet and continuously reads line voltage. A built-in front panel switching arrangement permits 1,000-w or 2,000-w line load, and reads resulting a-c line volt change due to load. Write H. D. Johnson, The Hickok Electrical Instrument Co., 10554 Dupont Ave., Cleveland 8, Ohio, for details.

97 times more OZONE RESISTANCE

in the new U. S. Royal Master High Voltage Power Cable

***Amazingly* better than ANY of the 5 leading brands tested!**

Test A—Here, a sample of 5 KV unshielded U. S. Royal Master Power Cable was bent into a U-shape, roughly 8 times its overall diameter. Placed upright on a grounded metal plate, a conductor-to-plate potential of 40,000 volts was applied. Because of this high test potential, the air broke down—and ozone cracks appeared. All 5 competitive cables failed within 20 minutes to 35 hours. The U. S. Cable was still going strong after 3400 hours! That's *real* ozone-resistance!

Test B—A sample of the new U. S. B-18 ozone-resistant neoprene jacket was stretched 200% of its original length, clamped in a metal rack, and put in an ozone chamber . . . where the ozone concentration was adjusted to .025% to .030% volume. Five other competitive jackets taken from leading brands were likewise placed in the chamber. Within 2 and a half hours, all jackets had failed—EXCEPT "U. S." This jacket sample did not fail until after 18 hours' exposure!

For full facts about the great high-voltage cable, call your nearest United States Rubber Company District Sales Office or write to address below. A representative will arrange to conclusively prove these facts.

US RUBBER

UNITED STATES RUBBER COMPANY

ELECTRICAL WIRE & CABLE DEPT. · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

TO BE PUBLISHED IN NOVEMBER

the 23rd Annual Manufacturers' Directory section of ELECTRICAL WEST

This handy guide to Western States outlets and service facilities contains:

1 DIRECTORY OF MANUFACTURERS listing manufacturers of electrical equipment and supplies, and their principal agents in this area.

2 WHERE-TO-BUY IN THE WEST, listing products alphabetically and who sells them in the West.

3 DIRECTORY OF APPLIANCE SERVICE AND REPAIR STATIONS.

4 DIRECTORY OF MANUFACTURERS' AGENTS handling electrical lines.

This Directory is your best and most convenient source for information on electrical products in the West.

KEEP IT HANDY USE IT REGULARLY

Published annually as a supplement to the November issue by

ELECTRICAL WEST

68 POST ST. *SAN FRANCISCO 4, CALIF.*

Paint Spray Cans

(32) Westinghouse Electric Corp., Box 2099, Pittsburgh, Pa.

Coastal Finish paint of this manufacturer is now available in 12-oz spray cans for convenience in touching up transformers. A three-can treatment provides primer, intermediate coat and finish, with the respective coats compounded to resist salts, acids and alkalis, heat and oxygen, it is stated. Cans can be stored indefinitely out of direct sunlight and in temperatures not exceeding 120 F, the manufacturer reports.

Low-Voltage Switchgear

(33) I-T-E Circuit Breaker Co., 19th & Hamilton St., Philadelphia 30, Pa.

This company's metal-enclosed switchgear is now available in a uniformly three-high frame arrangement through 3,000-amp air circuit breaker ratings for application at 600 v and below. Known as KD, the devices can be fully isolated in steel compartments only 30 in. wide, 30 in. high, with minimum frame depth of 58 in.

Underground Transformers

(34) Jefferson Electric Co., Bellwood, Ill.

A new direct burial constant wattage transformer for use on multiple mercury lamp circuits has been developed by this company. The transformers, sealed in rubber cases, are buried adjacent to street lighting fixtures and other outdoor lighting applications. The manufacturer says that sealing the transformers eliminates virtually all maintenance.

(35) SIGNALING — Hammarlund Mfg. Co. Inc., 460 W. 34th St., New York 1, N. Y., now has audio-tone signaling units available in a new physical package of modern modular design. They are used for transmitting and receiving signaling, dialing, telemetering, supervisory controls and other information. Up to 48 on-off or raise-lower functions can be controlled over a single circuit—telephone line, microwave or VHF radio—by use of the devices.

ANOTHER EXAMPLE OF Cope EFFICIENCY. . .

COPE 70,000 SERIES CABLE TROUGH WITH THE BUILT-IN COUPLER

now available in 12′ length

33% fewer connections

The new Cope 70,000 Series Cable Trough with the built-in Coupler is now available in 8, 10, and *12 foot lengths,* and affords you 80% SAVINGS in assembly time, PLUS 33% FEWER CONNECTIONS.

These features alone mean real savings for you, in time and money.

*PATENT PENDING

Cope

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Portland 4, Ore. Fred W. Carlson, 935 Northwest 12th St.
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San Francisco 11, Calif. George E. Honn Co., 420 Market St.
San Gabriel, Calif. H. J. Randolph Co., 736 Santa Anita St.

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Engineering Representatives

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NOW... string overhead power line conductors under tension with the new

PENGO TENSION WIRE STRINGER

Be sure to include this equipment in your 1956 Budget.

Photo shows Pengo Tension Wire Stringer used by Pacific Gas and Electric Company to string 266,800 cir-mil all-aluminum 22KV line at Pacific Grove, Calif.

New equipment makes it possible to get uniform controlled tension so that conductors can be tied in without further sagging!

Safest way yet devised to string conductor through energized lines!

Reduces cost of Line Stringing because it

1. Requires minimum personnel. Experience shows that complete control of the reel end of the line can be maintained with a single reel tender.
2. Reduces waste of conductor by eliminating short ends.

Made by the makers of the World-Famous
PENGO EARTH AUGERS
Write for additional information

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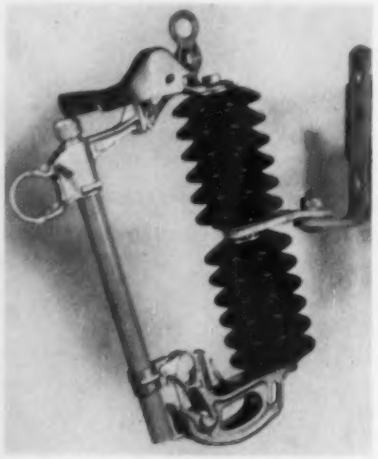


Distribution Cutouts

(36) Southern States Equipment Corp., Hampton, Ga.

These tube venting distribution cutouts are now available in voltage ratings of 5, 7.5, 15 and 25 kv; continuous ratings of 100 and 200 amp and increased interrupting capacities. Gases can escape at both ends of the fuse tube, with top escape port designed to direct high-velocity gases away from all live parts.

Safety Spectacles

(37) Watchemoket Optical Co. Inc., 232 W. Exchange St., Providence, R. I.

Interchangeable "snap-in" lenses allow these new safety glasses to serve more than one purpose. The various types of lenses are all of shatterproof Methacrylate and are curved for extra protection, it is stated. Convertible to three different types of sun glasses.

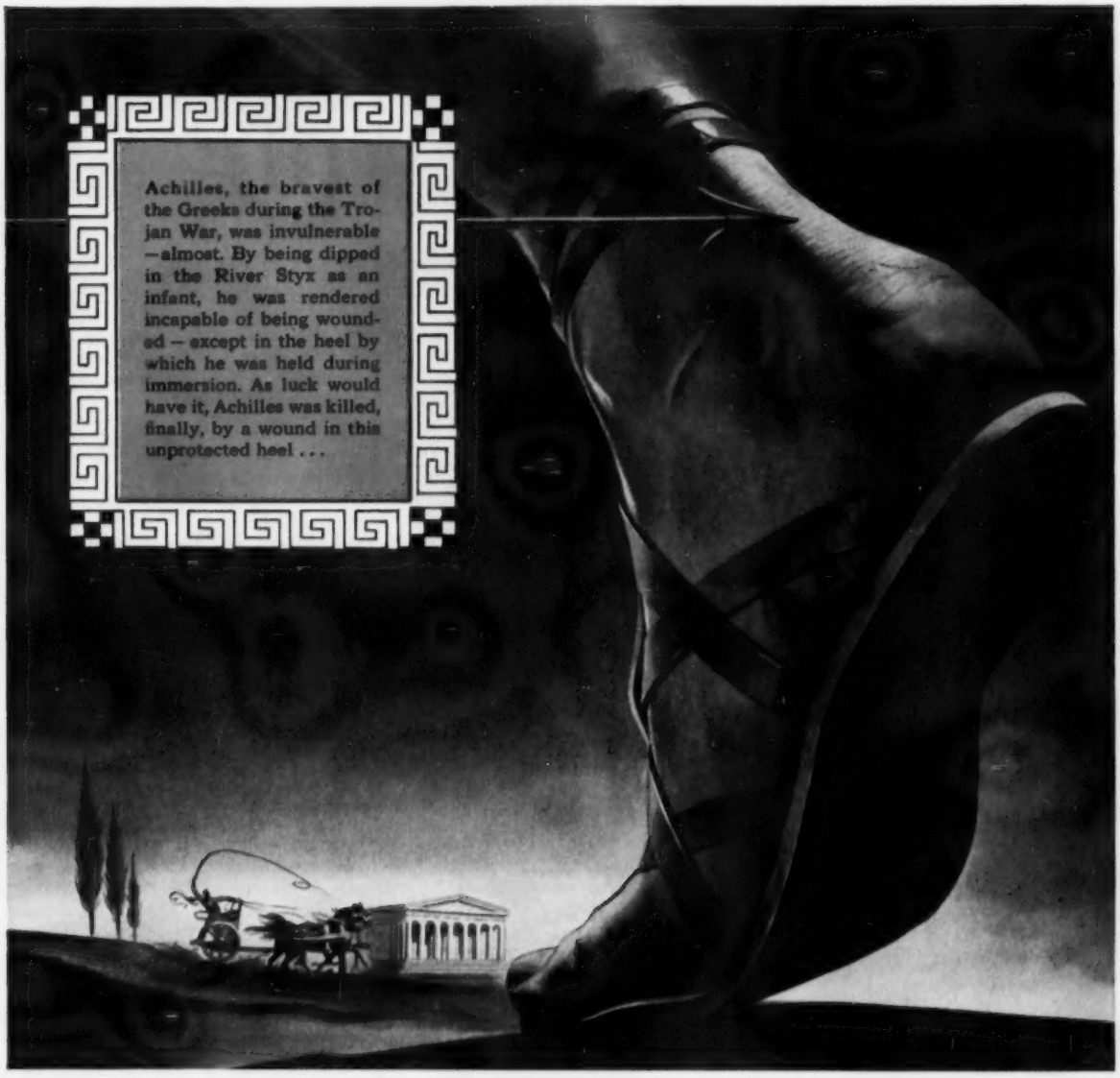
Portable Yard Lights

(38) Markel Electric Products Inc., 145 Seneca St., Buffalo 3, N. Y.

This company offers a new line of yard lights with pointed spears for sticking into the ground around patio areas, croquet courts or other outdoor areas. Designed for ornament as well as utility, the lamp is UL listed for outdoor use. Will accommodate 100-w lamps or smaller. Four models available.

(39) TAPE—This new pressure-sensitized film tape has a dielectric strength of 9,000 v and little corrosion effect on copper. Made by Mystik Adhesive Products, 2635 N. Kildare Ave., Chicago 39, Ill.

For more data fill in coupon, page 64


Achilles, the bravest of the Greeks during the Trojan War, was invulnerable—almost. By being dipped in the River Styx as an infant, he was rendered incapable of being wounded – except in the heel by which he was held during immersion. As luck would have it, Achilles was killed, finally, by a wound in this unprotected heel . . .

NO ACHILLES HEEL

The final test of most products for industry is their ability to withstand – *completely* – the corrosive effects of long periods of time. In cables this is especially true, since no part of any cable is more serviceable than its weakest point. Fortunately – but not accidentally – no Achilles heel limits Kerite insulation. Kerite cable in perfect working condition after 40, 50, and more years of difficult service is the rule, rather than the exception.

The value and service life of a product can be no greater than the integrity and craftsmanship of its maker.

Founded 1854

KERITE CABLE

THE KERITE COMPANY—30 Church St., New York 7, N. Y.
Offices also at 122 S. Michigan Ave., Chicago; 582 Market St., San Francisco;
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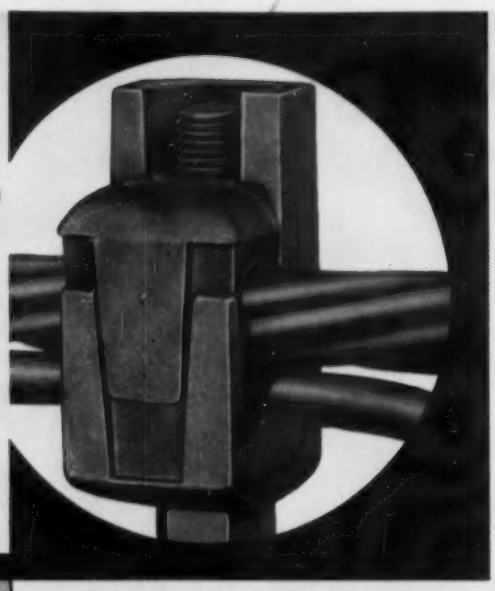
Anderson's
SUCCESSOR
to the
SPLIT
BOLT



EXTRA Strength . . .
high strength bronze alloy bodies and high-tensile silicon bronze bolts.

EXTRA Savings . . .
re-usable, time and time again.

EXTRA Fast . . .
simple, one-piece construction allows installation over two maximum size conductors without disassembly. No falling off line during assembly.

EXTRA Dependable . . .
positive high-pressure clamping action maintains low-resistance contacts. Design of "jaws" provides complete enclosure of the conductors.

HIGH STRENGTH BRONZE ALLOY

Dura-GRIP

"DG" CONNECTORS

The answer to any problem of high-pressure contact in their cable range . . . especially designed to meet today's increasing loads on distribution systems. The extra clamping strength of Anderson's "DG" Connectors assure trouble-free, long-life connections. Long, strong "jaws" plus long silicon bronze bolts combine to provide linemen with a truly "fumbleproof" connector that will save time and eliminate handling difficulties. They will "hang" without turning over . . . no nuts to lose . . . no need *ever* to completely disassemble.

Catalog Number	Cable Range Max. Solid	Max. Str.	Max. Nominal Cable Diameter
DG-8	6	8	0.162
*DG-8SH	6	8	0.162
DG-6	4	6	0.210
*DG-6SH	4	6	0.210
DG-4	3	4	0.233
DG-2	2	3	0.258
DG-1	1	2	0.292
DG-1/0	2/0	1/0	0.368
DG-2/0	3/0	2/0	0.414
DG-4/0	4/0	4/0	0.522

*Furnished with slotted head bolts
NOTE: Minimum clamping range is one maximum conductor.

FOR MORE COMPLETE INFORMATION . . . consult your nearest ABW representative or contact our home office.

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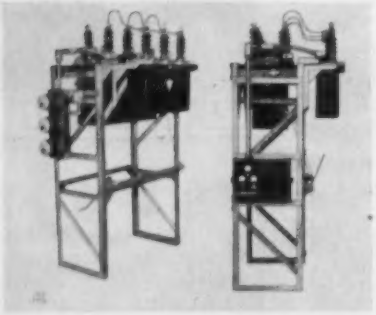


Current Metering Devices

(40) Line Material Co., Milwaukee 1, Wis.

New current metering devices offered by this company are used with its Kyle type R recloser and TR transformer to observe load growth for system planning information. Two devices available; one is a conventional meter indicating instantaneous value of current in each phase; the other a thermal ampere-demand meter responding to temperature changes caused by the changing values of current. The first is pictured at right, the second at left in photo above.

Split-Bus Enclosure

(41) Wadsworth Electric Mfg. Co., Covington, Ky.

Latest addition to this company's circuit breaker line is a split-bus enclosure with room for six double-pole breakers. Also has 10 single-pole branch circuits controlled by one of the double-pole breakers, leaving five breakers free for individually wired appliances. Enclosures available with sealable trim, surface or flush mounting, and raintight.

Lightning Arrester

(42) RT&E Co., 1900 E. North St., Waukesha, Wis.

This manufacturer's new lightning arrester in 9- and 18-kv designs features a spiral grooved expulsion chamber and mechanical and electrical isolation from live line parts. Another feature stated by the manufacturer is elimination of radio interference. Full information is contained in Arrester Bulletin 6000.

(43) PLASTIC STRAPS — Noncorrosive plastic straps for fastening and supporting all types of open wires, cables and cords have been developed by Holub Industries Inc., Sycamore, Ill.

To Secure Bulletins Fill in Coupon on Page 64

SPANG® CONDUIT

—easy bending qualities aid construction of 3 public parking garages

The easy bending qualities of Spang Conduit were put to the test in the construction of three public parking garages where construction plans required tricky bends around columns and beams. But, from all three construction sites the electrical construction crews reported fast, trouble-free conduit installations with SPANG HD (Hot-Dipped, Heavy-Duty) Galvanized Conduit.

That's because of SPANG'S *quality-control* manufacturing which produces a uniform product every time. There are no hard spots to create bending problems, breaks or splits. And SPANG HD's uniform galvanized and lacquered finish does not chip, flake or peel even under the most severe bending strains.

Let SPANG be your first choice for all conduit installations. Contact your nearest SPANG Distributor for *top-quality* service.

PITTSBURGH: Allies Garage, Boulevard of the Allies and Smithfield Street. Six levels, 528 spaces. Designed as a giant ramp with half of each floor sloping down, other half sloping up. Motorist can park his car on any level. Two self-service elevators serve all levels. SPANG HD Galvanized Conduit is installed along columns and ceilings for lighting and elevators. Cost: $741,000. In operation July, 1955.

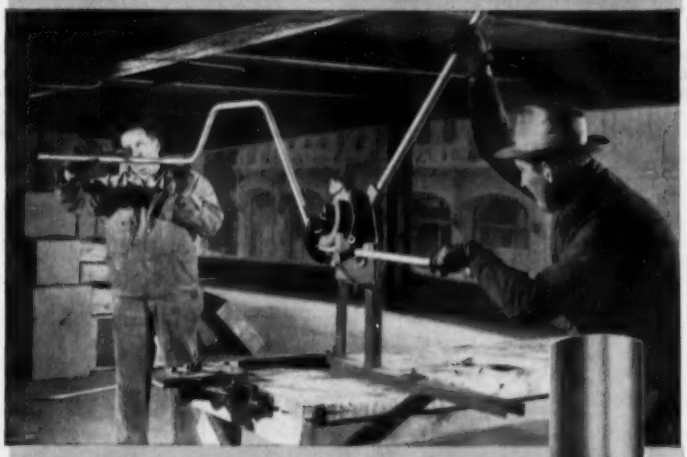
Owner: Pittsburgh Parking Authority
Architect: Hoffman & Crumpton
Contractor: Ragnar Benson, Inc.
Electrical Contractor: Fischbach and Moore, Incorporated
Spang Distributor: Keps Electric

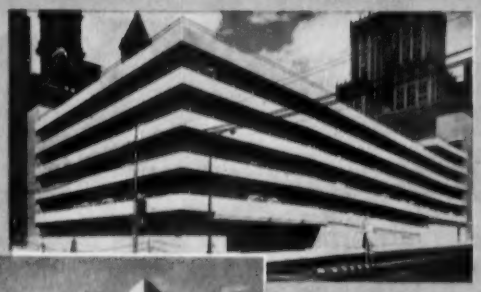
CHICAGO: Parking Facilities No. 1, 11 West Wacker Drive. Fourteen levels, 717 spaces. World's largest mechanical parking garage. Served by five Bowser System automobile elevators which travel horizontally as well as vertically within the shaft. SPANG HD Galvanized Conduit is imbedded in concrete, serving elevators, intricate controls and lighting. Cost: $1,665,557. In operation February, 1955.

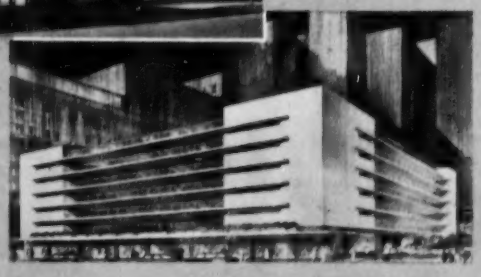
Owner: City of Chicago
Architect: Shaw, Metz & Dolio
Contractor: Herlihy Mid-Continent Co.
Electrical Contractor: Knott & Mielly
Spang Distributor: Effengee Electric Supply Company

PITTSBURGH: Diamond Street Garage, Diamond and Smithfield Streets. Seven levels, 864 spaces. Conventional design for service in retail shopping center of Downtown Pittsburgh. Three self-service elevators. Includes seven first-floor stores facing on Smithfield Street. All SPANG HD Galvanized Conduit runs imbedded in concrete supply service to stores, elevators and general lighting. Cost: $1,395,000. In operation November, 1955.

Owner: Pittsburgh Parking Authority
Architect: Hoffman & Crumpton
Contractor: United Construction Company
Electrical Contractor: Fischbach and Moore, Incorporated
Spang Distributor: Keps Electric







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District Offices and Sales Representatives in Principal Cities

BULLETINS ETC.

(44) SUPPORT JACKS — Self-stowing support jacks manufactured by J. H. Holan Corp., 4100 W. 150th St., Cleveland 11, Ohio, are described in a bulletin now available from the company. Diagrams show how the self-stowing feature of the jack works when not in use supporting truck loads.

(45) TRANSFORMER POWER AND LIGHTING CONNECTIONS—Kuhlman Electric Co., Bay City, Mich., offers information on the more common single-phase applications of transformer power and lighting connections. Ask for bulletin CS-102. Fully diagrammed.

(46) DRAWINGS FILE SYSTEM—This information deals with mechanized copying and filing of drawings, blueprints, etc., with a system developed by Filmsort Division, Dexter Folder Co., 50 S. Pearl St., Pearl River, N. Y.

(47) LIGHTNING PERFORMANCE OF TYPICAL TRANSMISSION LINES—The lightning experiences of 68 power companies in the operation of 119 different transmission lines are carried in this 130-page book offered by Ohio Brass Co., 380 N. Main St., Mansfield, Ohio.

(48) ALUMINUM BUILDING WIRE—Characteristics and other information of Kaiser Aluminum's type TW building wire are contained in this booklet. Write to the company at 1924 Broadway, Oakland 12, Calif.

(49) OVERHEAD CRANES — A new 32-page book, designed as a reference manual, by Moffett Engineering Co., 579 Cleveland Ave., Albany, Calif., is now available. A wide variety of standard and special overhead cranes is described. Planning data are included.

(50) MEETING ROOM EQUIPMENT — How to make visual aid equipment from aluminum is explained in an instruction booklet now available from Reynolds Metals Co., 2500 S. Third St., Louisville, Ky. Detailed construction plans for a lectern, flannel board, carrying case, easel and other items are given. The booklet is called "Meeting Room Ideas."

(51) TONE SIGNALING—Hammarlund Mfg. Co. Inc. is offering a six-page brochure about the operating features and performance of its new supervisory tone equipment for centralized operations control. The address is 460 W. 34th St., New York 1, N. Y.

(52) TAPE PRODUCTS — Detailed application and performance information about Bishop Mfg. Corp. tapes is given in a new brochure. Address is 46 Factory St., Cedar Grove, N. J.

(53) MERCURY VAPOR LAMP TRANSFORMERS —Most recent specifications on Sola Electric Co. mercury vapor lamp transformers are now available in Bulletin MV-211. The publication is devoted to lamps for indoor commercial and industrial use. Address is 4633 W. 16th St., Chicago 50, Ill.

(54) ARRESTERS AND CUTOUTS—Design, application and performance of Autogap lightning arresters are described in this 20-page color booklet published by Hubbard & Co., 6301 Butler St., Pittsburgh 1, Pa.

(55) SERVICE ENTRANCE EQUIPMENT—A new supplementary catalog of General Switch Corp. fusible service entrance equipment is now available. Address is 45 Reebling St., Brooklyn 11, N.Y.

KILL TWO BIRDS WITH ONE STONE — Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after December 1

Please send me, without obligation, the new product information or catalogs:

If described in Product News, circle item number

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GENUINE FWD PARTS

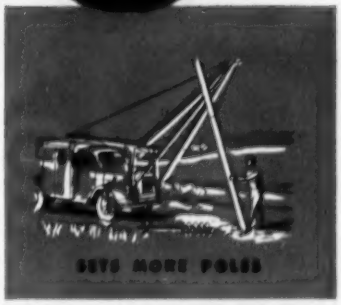
Specially Built—

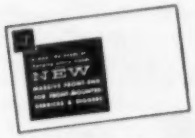
to take front-end "overloads"

...to work and travel anywhere

FWD's 2-Man "Rhino" Line Truck

Here is a completely new, specially-designed line truck that lets you stretch skilled manpower . . . save line construction and maintenance dollars. Massive front-end gives you ruggedness needed for front-mounted derricks and diggers. FWD's four wheel drive "Rhino" unit fits any front-mounted derrick or digger . . . helps two-man crew *move and work forward*, digging more holes, setting more poles—in less time and at a great manhour saving. FWD trucks are well-known for getting tough jobs done, anywhere. Here's another specific job application custom-engineered just for you.





Write for this informative "Rhino" line truck folder—or call the FWD utility specialist.

BUILDERS OF AMERICA'S FWD FOREMOST HEAVY-DUTY TRUCKS

MATH-O-MATIC DESIGN

THE FOUR WHEEL DRIVE AUTO COMPANY

CLINTONVILLE, WISCONSIN · *Canadian Factory*, KITCHENER, ONTARIO

ELECTRA'S HUSBAND

"SAY, what do you people out here think about toll-TV?" an eastern visitor asked one evening recently just as we were finishing dinner. "As you may know, it is about the hottest controversy ever to develop in the TV and radio business."

"Don't expect any kind of an intelligent answer here," I commented, with a sly look at Electra. "You know that ours is one of the few non-TV homes in this area."

"Listen to me, Mr. Big, you can bring a television set into this house any time that you wish," Electra burst out belligerently. "Only remember this: the day that you move it in, I move out."

"Wait a minute," our guest interposed hastily. "I don't want to start any family arguments."

"Don't worry—there won't be any argument because the matter is settled," I declared cynically. "Ours is strictly a radio home."

"We have six radio sets and that ought to be enough," Electra said in her own defense. "It's just that I think most of the TV programs are immature, overglamourized or just plain lousy."

"Oh come now, you're basing your opinion on just a few programs," our guest challenged.

"But isn't television for pay designed to correct the very deficiencies that Electra points out?" I asked. "As I understand it the programs would consist of the best new plays, first-run motion pictures, opera and other really outstanding entertainment."

"That's what the proponents claim," he explained. "But I can't get tremendously enthused over the notion of seeing a Broadway first-night performance in my living room. Nor seeing and hearing a first-run or preview movie either on my television set. After all, stage shows and movies are sometimes flops, just like some radio and TV programs. Why should I pay to see what the magazine *Variety* would call an egg?"

"You can say that again," Electra muttered.

"If I remember correctly, back in the days when you were in the publishing business and radio broadcasting was just beginning, you were in favor of having radio on a paid basis," I reminded our guest.

"That's right," he averred. "It seemed reasonable to me then that radio-set owners should pay a monthly charge just the way we charged our subscribers a nominal sum per year to receive our magazines and let the rest of our revenues come from advertisers. But the idea wasn't feasible. I realized then and still do that the listener makes a sizable investment in sets, and pays for maintenance and the electricity to run them. In other words, broadcasting is not free, although the network, station and the program owner get no part of this money.

TO PAY OR NOT— IT'S STILL TV

"Maybe if there was a charge for TV, the programs would be better," Electra suggested.

"You mean we might get a set?" I casually volunteered.

"Shut up and let Edgar talk," she remonstrated.

"The quality of the programs is high now," he said. "And they are getting better. There are some truly wonderful shows scheduled for this fall. Like the CBS 'Shower of Stars,' ten Saturday night specials and 'Omnibus.' NBC will have 'Matinee,' 'Color Spread,' the Milton Berle Show and 'Producers Showcase.' All of these will be in color too.

"However, that isn't the point. The question of pay is a matter of fundamental principle. Any deliberation of toll-TV must also include consideration of toll-radio—both AM and FM. One can't be free and the other part paid and part free."

"How do you justify that?" I asked.

"Suppose sports events such as the World Series and the Saturday football games, which will soon be telecast in color, all go toll-TV. Might they not be taken away from the public on radio?" he reasoned. "It would be logical. The same goes for the Metropolitan Opera and the great symphonies that are now heard over radio."

"There would be hell to pay around our house," I mused. "What with most of the radio stations turning more and more to canned music it's difficult to find good listening as it is."

"You could go to the neighbors when you wanted to watch a game," she taunted.

"Or to one of the bars in the neighborhood," I muttered.

"Stop baiting each other," our guest admonished. "It seems to me that if people should be asked to pay for programs, someone must determine if the charges are to be made on a per program basis or on the use of the sets by the day, the month or the year. If broadcasting should be on a pay basis, should it be part free, part paid, or all paid? If payment is to be made in any form, somebody ought to examine the idea of metering the usage of set just like we meter gas, electricity and water."

"You're really a little bit perverse, aren't you?" I chided.

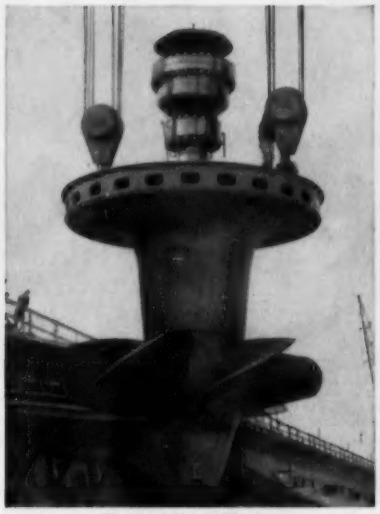
"No I'm not," he argued. "If somebody is to be paid, who should it be? The broadcasters? Why not the government? Perhaps the government should charge everybody for licenses—the broadcasters and the set owners too. What effect would a part-paid, or all-paid system have in a national emergency? After all radio and TV are our greatest means of mass communication.

"It's hard for me to figure out from all of the controversy whether we are going to have our radio and TV scrambled, poached, fried, hard, soft or raw. You can read anything you like into this list of the future of the egg. What kind of an egg will be laid?"

"But," said I, "if TV follows the same pattern as radio, its best years for free entertainment are right now. Introduction of color is backed up now by a huge investment for talent and programs to entice people to buy sets. When saturation is reached that kind of money may not be so free. Whether costly programs survive any better than symphonies have on radio is my question. Commercial sponsors alone aren't carrying the entire bill now. So if we are ever to eat our eggs we'd better do so while they are fresh and appetizing."

"Well if either of you brilliant gentlemen think that you have influenced me one little bit on putting a television in this house, you have each laid an egg," Electra affirmed positively.

3 TYPES of Hydraulic Turbines

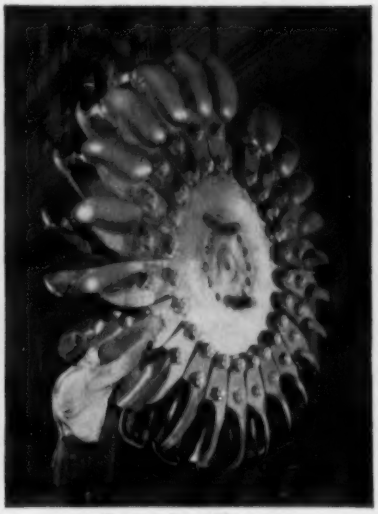


Propeller Type

Regularly chosen for low heads, up to 100 feet normally, and in exceptional cases even higher. Its higher speed effects appreciable savings in generator cost.

Francis Type

Used for heads up to 1000 feet — in some cases even higher heads — depending on the output capacity of the unit, the quality of operating water, and the character of load to be carried.



Impulse Type

For heads as high as pressure pipe lines can be built. Used for heads as low as 200 feet if water conditions prevent use of Francis type because of excessive wear.

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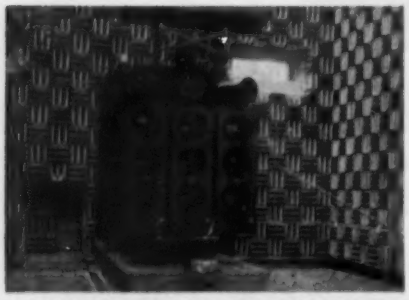
Over 14½ million installed horsepower of hydraulic turbines throughout the world.

FIRST USE OF A HIGH-DIELECTRIC GAS for power transformer insulation, which foretells eventual displacement of oil- and askarel-filled designs, is discussed here by J. W. Seaman (right), General Manager, and J. W. Butler, Manager—Marketing of General Electric's Power Transformer Department.

UPRIGHT SHIPMENT OF ALL POWER TRANSFORMERS from G.E.'s Pittsfield, Mass., plant this last year highlights the successful efforts of G-E engineers to keep designs compact, making installation simpler, faster, less costly. Above, transformer and all accessories are shipped on same car.

Recent advances in power transformers spotlight

PROGRESS IN REDUCING SYSTEM COSTS



FULL-TIME OPERATION OF G.E.'S SOUND LAB is speeding the design of quieter transformers, permitting their installation closer to homes.

FASTER DESIGNS, GREATER ACCURACY are results of card programmed calculator checked here by Analytical Engr. E. Magnusson and L. Wetherill, Mgr.—Power Trans. Engrg.

Gas for insulation and cooling suggests direct operating savings, new reduction of noise problem

One of the most radical developments in power transformers, the practical application of sulfur hexafluoride for insulation and cooling, holds considerable promise for helping electric utilities meet the need for higher-voltage units at lower expenditures per kva.

NEW TRANSFORMERS

As a result of more than two years of prototype development, two 2000-kva, 69-kv transformers are nearing completion at General Electric's Power Transformer Department in Pittsfield, Mass. Following field test experience in cooperation with Consolidated Edison of New York, the new gas-filled design may well be extended to much higher ratings with consequently greater savings in store for the furure.

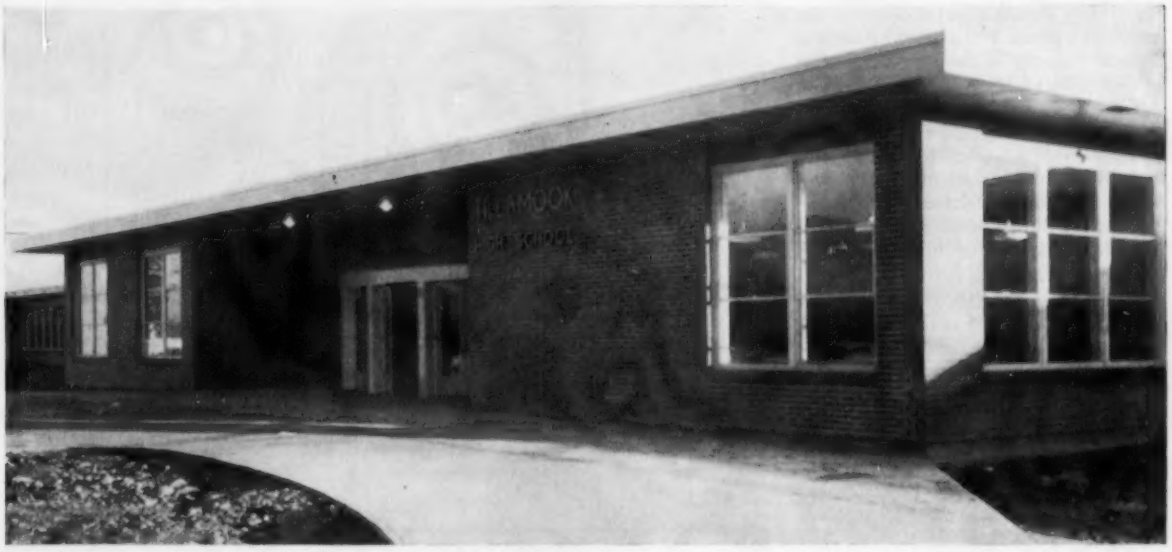
For the electric utility industry, the new transformer design will offer attractive economies through improvements in safety, sound, and lightness. The oil hazard has been removed, transformers can be more easily installed, and, perhaps most important, they can be installed closer to load without creating undue acoustic disturbances.

Like the rapid acceptance of upright transformer shipments and the advances in noise reduction forecast by full-time operation of G.E.'s Transformer Sound Laboratory, gas-filled transformers mark another example of the significant progress that General Electric engineers, working in co-operation with the utility industry, have made toward improving system operation and lowering system investments. For more information contact your G-E Apparatus Sales Representative. General Electric Co., Schenectady 5, N. Y. 301-298

More Power to America

GENERAL ELECTRIC

ELECTRICAL WEST SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. VOL. 115 No. 4 OCTOBER 1955



Capital investment saving, space gained and lower maintenance costs led school board to adopt electric heating for new high school

Electric heat in schools

Can Improve Attendance Record

Control of positive ions in electrically heated air has been found to reduce sinus and respiratory ills

Glenn W. Todd
Superintendent
Tillamook, Ore., High School

Often cited as the largest electrically heated educational institution in the nation, Tillamook, Ore., High School has been the recipient of many inquiries from educational circles, school boards, architects, engineers and electric utility officials concerning various aspects of the heating system. The practicability and economics of large electric heating installations appear to be subjects of a controversial nature. The writer is not qualified, technically, to present a case for or against electric heating, nor does he wish to do so. However, the widespread interest in our school's heating system would seem to invite a review of the circumstances leading to the school board's selection of electric heat and also a report on the general performance of the heating system.

The author's association with Tillamook High School began two years after the new building was completed, so he came to the district with no prejudices and no preconceived ideas about the design of the plant. Therefore, the opinions as expressed herein have been reached objectively.

Board members of Tillamook School District No. 9 faced a dilemma in the autumn of 1949 not unlike that which confronted school officials pretty generally throughout the nation. The serious problem of overcrowded building facilities was even more acute in the Pacific Northwest where the phenomenal postwar migration had already created an unexpected population unbalance that caught civic planners unprepared. Tax dollars, particularly from school levies, were alarmingly insufficient for the sudden demands of swelling school enrollments. And the trend had just begun.

Voters of Tillamook County had dutifully passed an election bond issue of $800,000 for replacement of the district's antiquated high school physical plant and architects were commissioned to submit proposals for a new one. Though requirements were scaled down to a drastic minimum, estimates for building the new high school as planned exceeded the budget by thousands of dollars. Construction details,

building materials and space requirements were analyzed from every approach in an effort to make the available funds do the job, but no solution seemed possible.

One item in particular that furrowed the brows of board members was the estimated cost of the heating and ventilating installation proposed in the architect's plans. Influenced by the analytical thinking of the school superintendent, Ward Hammersley, who had studied electrical engineering, and by Board Member Archie Pye, who had architectural training, the group felt that the proposed heating system demanded too large a share of the building budget. But how to cut it and still provide comfort for this one-story, rambling 113,000 sq ft of space?

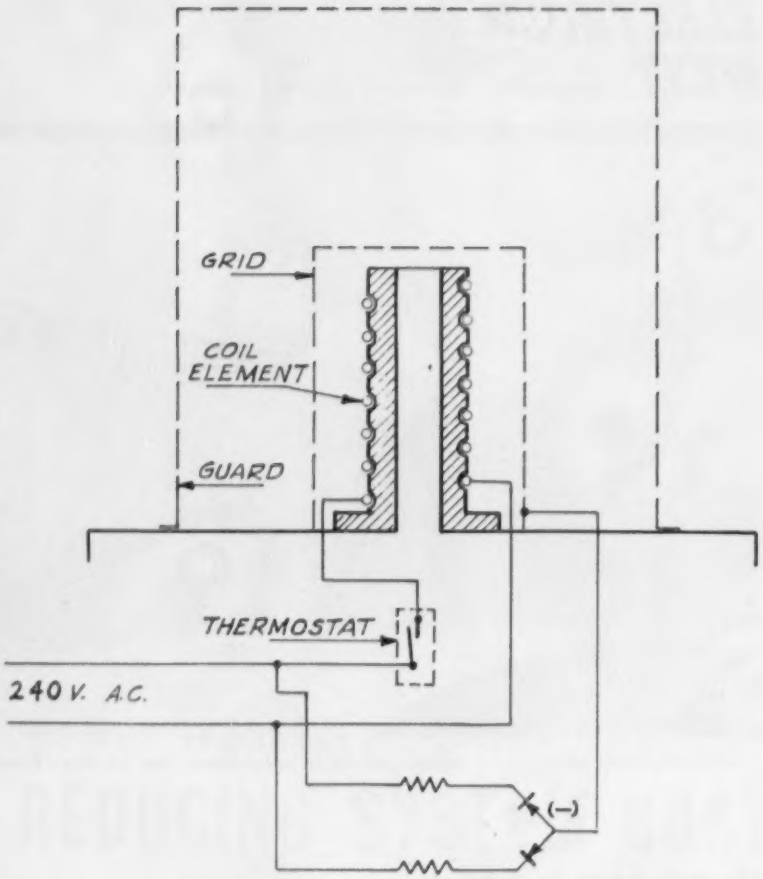
Facetiously, probably, one member casually suggested that maybe electric heat would solve their problem. The fact that several of those present were enthusiastic users of electric heating in their own homes caused an instant spark of interest in what otherwise might have been ignored as trivial conversation. Electric heat! Electric heat in a building some 100 times larger than an average residence?

"Why not?" queried one of the home owners. "One room or a hundred rooms, each one represents a separate and independent problem as far as electric heating is concerned. And, if it's practical and economical to heat one room electrically, I don't see what the number of rooms matters."

"But, what about power availability, rates, etc., for an installation of this size?" someone asked. The idea definitely had aroused enthusiastic interest but it was apparent immediately that there were many, many technical questions to be answered before any serious consideration could be given. The board decided to confer with representatives of the electric utilities serving the community to find out if their idea had merit and was feasible.

Paul F. Hatch, manager of the Tillamook County Peoples Utility District, had a background of considerable experience in electric space heating and was in a position to anticipate the effect of such a load upon the utility system. Large-use industrial customers such as sawmills and the huge Tillamook cheese factory were responsible for daily and seasonal load curves that obviously would be complemented by the prospective sizable school heating load if it could be controlled properly.

After careful study and consultation with rate and engineering specialists of the Bonneville Power Administration, from which the Tillamook utility purchases power, Hatch was authorized by his board of directors to offer the school district a contract containing rate and provisions for serving the electric heating load.



Schematic diagram of electric resistance space heater with ion control afforded by pulsating negative charge supplied by selenium rectifier to grid surrounding heater element

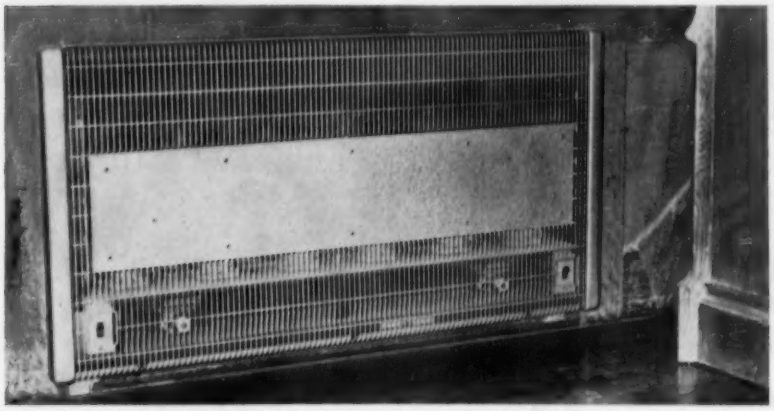
With this measure of assurance from the utility, the next considerations were the matters of costs of electric heating equipment and installation, costs of operation and general design of the system. School electric heating was new in the Northwest and the very few small installations in operation afforded meager and insufficient data or history. It was known, however, that a number of California institutions had been heated electrically for several years.

The Tillamook school board called upon the Wesix company for performance reports from the California schools, since its equipment had been used in many of the schools. General recommendations, estimates and appraisal relative to the proposed installation were requested. Board members made personal inspection trips to some of the California schools, conducted performance tests on various types of equipment and otherwise made exhaustive search for information to validate their decision. Their responsibility to the taxpayers rested heavily upon their shoulders because the reports of the commissioned architect and mechanical engineer definitely were not favorable to electric heat.

The Wesix people, pioneers in electric heating, consolidated all available data and prepared detailed estimates of installation and operating costs. Considering all factors, including capital investment saving, building construction economies, space gained, lowered maintenance costs, less depreciation, flexibility of control and favorable rate contract for satisfactory power cost, the balance sheet showed undeniably in favor of electric heat. The district could see its way clear to provide the building facilities so direly needed with the funds available.

The decision thus made, the task ahead lay with the architect, the electrical engineer and the equipment manufacturer. Personnel of the Portland architectural office of the late Lee A. Thomas, AIA, sensed this opportunity

Ion-controlled electric heaters installed beneath windows in Tillamook school classroom



Combined heater and negative ion generator of type installed in Tillamook High School

of establishing a new low cost-per-square-foot record for school construction and cooperated wholeheartedly in working out necessary revisions of the original plans. The electrical engineering firm of Wally Matson & Associates, Portland, designed an ingenious control system for integration and zoning of the highly diversified heating equipment in the sprawling plant. The utility district designed transformation and control systems especially to serve this unprecedented heating load of some 1,200 kw, plus lighting, power, water heating and cooking load of 113,000 sq ft of building area.

Determining the type of heating system for Tillamook High School presented a somewhat different problem than usually is encountered in the selection of conventional combustion plants, in that there are so many basically different kinds of electric heating units. By 1949 the Wesix company had achieved considerable success in its study and control of air ionization, and in the development of heating equipment capable of producing controlled ionization. Reliable clinical and laboratory research indicated that negatively ionized air might have certain beneficial effects upon the human biological system, principally the respiratory process. There was evidence of relief or freedom from the common cold, hay fever, asthma and certain allergies by persons breathing air of predominantly negative ionization. Certainly negatively charged air was fresher to the senses, cleaner, more invigorating.

Cognizant of the value of any air conditioning process that might improve school attendance records as a result of more healthful environment, the board approved ion-controlled heating units for classrooms, offices, library, cafeteria and other smaller rooms.

It followed quite naturally, then, after a reasonable lapse of time, that interested parties proceeded to examine attendance records for any indication of noticeably beneficial effects. It was realized that a comparison of various school attendance records, one against another, would not necessarily be indicative of general or specific health standards. All school administrators and instructors are aware that such factors as seasonal and occupational absenteeism, different grade levels, numerical sex proportions, epidemics, weather conditions, rural vs urban communities, and others can and do distort attendance figures. Whether or not attributable to the ion-controlled electric heating system, Tillamook High School's 1953-54 average attendance was, by all standards of comparison, commendably high (6.238% absenteeism). The significance of this highly favorable attendance could not be measured because there was no other comparable school, by size, enrollment, or grade level in the locality.

There was by this time, however, an opportunity to compare attendance records of four elementary schools in Tillamook County that are statistically similar, one of which is heated electrically. The new East School classrooms are heated with ion-controlled equipment identical with that used in the Tillamook High School. The accompanying tabulation covers the school year 1953-1954.

The noticeably lower absentee rate for the electrically heated East School cannot, of course, be considered as conclusive evidence for the effectiveness of ion control on students' health. But the unquestionably high attendance rates for both schools is reason enough to encourage continuing and increasing interest by educational and scientific observers. Personally, the writer can enthusiastically endorse the board's selection of electric heating systems in the Tillamook High School and in the East School. From an administrator's viewpoint, the negligible maintenance factor, the ease and accuracy of temperature control, the cleanliness and the general comfort are all advantages that contribute greatly to a highly satisfactory school heating system.

School Attendance Record

School	Grades	No. of Pupils	Total Days Membership	Total Days Absence	Per Cent Absenteeism
Liberty	1-8	544	75,529	5,724.5	7.579%
Wilson	1-6	357	56,681	3,841.5	6.777%
South Prairie	1-6	238	38,370	2,738.0	7.136%
East	1-6	241	39,328	2,351.0	5.978%

Typical 2-hp air well heat pump (left) with oil furnace auxiliary. Right: This is the type of construction used for the air wells

Here are two new

Electric Space Heating Ideas

1. Give customers a satisfactory heating system
2. Build a desirable type of load for the utility

A. B. Martin
Engineering Consultant
Washington Water Power Co.

In its efforts to find a solution to the electric space heating problem the Washington Water Power Co. proposes two new approaches. One is the use of a small or undersized heat pump in combination with an oil-fired furnace. The heat pump would handle approximately 80% of annual heating requirements and operate at very high annual load factor. Automatic controls would cut in the furnace to handle the heating peaks. This approach is the subject of this article.

The other idea is the use of a 3- to 5-kw resistance heater placed in the forced-air duct system of a central furnace. This would handle heating requirements down to 40 F, at which point a dual control would cut out the auxiliary electric heater and start up the furnace. The customer would derive the benefits of electric heating on chilly mornings and evenings and for a fair proportion of the year, and the load would have desirable characteristics for the utility. This system is completely designed and a heating unit is now being manufactured in Spokane. The utility has an active promotional campaign ready to launch. Details of the system will be given in an early issue of ELECTRICAL WEST.

Background of Problem

Before presenting the new heat pump idea mentioned, some of the economic and competitive background leading to development of the two new systems will be discussed.

The annual residential consumption of electricity in the Pacific Northwest is more than two and one-half times the national average. While this situation results in prosperous operations for the distributing utilities, long-range planning for the retention and sound economic growth of our electric business requires an evaluation of the changes that can be expected in the basic factors that have been responsible for these high annual consumptions.

The Washington Water Power Co. now has an average residential customer usage of 7,300 kwh per year with an annual growth rate of 500 kwh per customer. This high consumption is attributed to:

1. A progressive, sales-minded management that foresaw a good many years ago the value of the relationship between low rates and high consumption.

2. Excellent public relations with general acceptance of the electrical way of living as the only standard.

3. Lack of the distribution of low-cost natural gas in the area.

Continuance of low electric rates with the increasing loads of the future will be dependent, first, upon owning adequate low-cost generating facilities, second, upon maintaining present high annual load factors and, third, upon continued attention to the lowest possible operating costs.

Construction of Washington Water Power's new 400,000-kw Noxon hydro project, which will be completed in 1959 and 60, and its participation in the Pacific Northwest Power Co.'s Mountain Sheep and Pleasant Valley Snake River developments, along with other long-range planning, are evidence of the utility's determination to own its own power resources. However, future generating plants will cost more per kw than existing plants and will be a major influence toward future higher kwh costs.

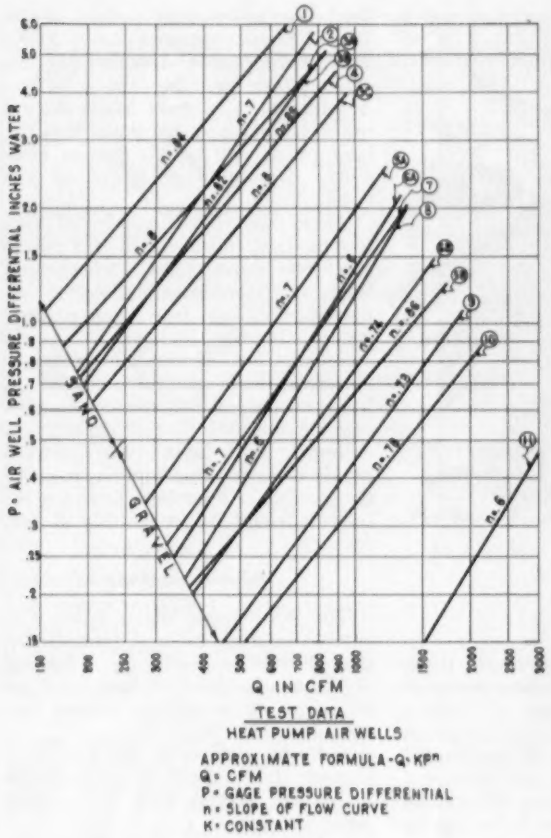


Fig. 1

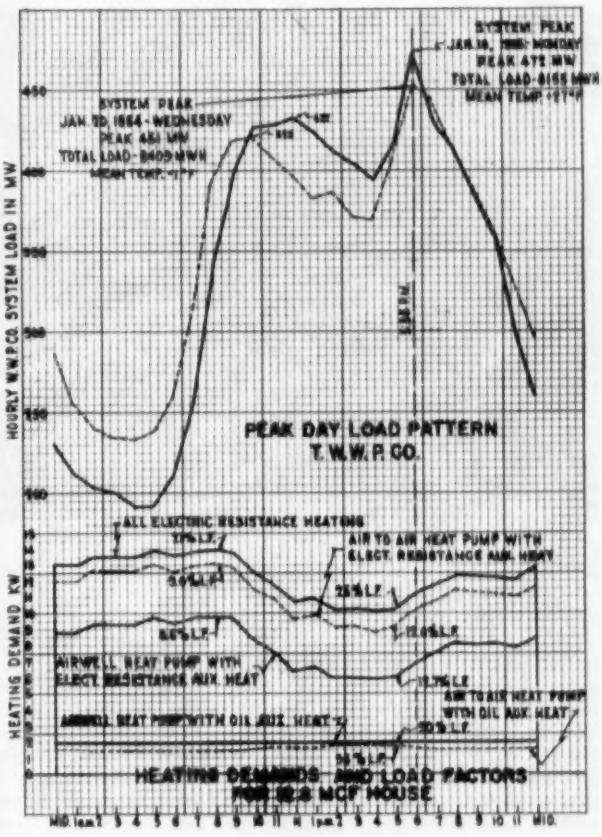

HOURLY KWHPCO. SYSTEM LOAD IN MW
HEATING DEMAND KW
SYSTEM PEAK
JAN. 10, 1954 - WEDNESDAY
PEAK 481 MW
TOTAL LOAD - 8409 MWH
MEAN TEMP. -1°F
PEAK DAY LOAD PATTERN
T. W. W. P. CO.
ALL ELECTRIC RESISTANCE HEATING
AIR TO AIR HEAT PUMP WITH ELECT. RESISTANCE AUX. HEAT
AIR WELL HEAT PUMP WITH ELECT. RESISTANCE AUX. HEAT
AIR TO AIR HEAT PUMP WITH OIL AUX. HEAT
HEATING DEMANDS AND LOAD FACTORS

Fig. 2

For the past two years the company has been investigating the impact upon its future electric business of the following:

The introduction of natural gas in its service territory in the fall of 1956; the load building potentialities of electric heat pumps; the increasing use of electric space heating and its tendency to reduce system load factors; the promotion of fall and spring use of supplemental electric heating.

Although there have as yet been no announcements of natural gas rates, it can be expected that they will be competitive on a thermal basis with heating oils. There are many unfavorable features facing the distributors of natural gas in the Pacific Northwest that will tend to keep their rates high and result in some disillusionment for consumers when it is realized that gas is not going to be the "low cost" fuel they have been led to expect. Some of these are increasing gas field prices because of competition for reserves, long distance transmission lines, limited industrial dump loads for pipe line load factor improvement, high distribution plant costs because of the prevalence of pavement and solid rock, and high distribution operating cost because of low customer density.

The Washington Water Power Co. now has more than 85% saturation of both electric ranges and electric hot water heaters with an extremely high degree of customer satisfaction. We believe that the long experience of Pacific Northwest housewives with electric ranges and hot water heaters gives us a strong pre-emptory position. With low electric rates there will be little or no saving in operating costs between domestic electric water heating and gas to encourage the customer to go to the expense of installing gas equipment with all of the inconvenience of providing flue connections. Our sales forces have been highly successful in a campaign to locate and replace or modify older electric hot water heaters with modern quick recovery elements. Education of builders to the advantages of the new 200-amp entrance code is also being effective and will provide for future electric appliance growth.

The situation will be more competitive for future new homes constructed on gas mains. But even here the "landslide" to gas installations predicted by the public statements of gas salesmen will be far from realized.

Residential space heating is the announced primary objective of the gas people with the intention of invading the basement and then working upstairs. For many years the Washington Water Power Co. has cooperated with oil and coal dealers in the promotion of automatic residential heating plants. In conjunction with the availability of improved heating equipment and the perfection of fuel dealers' "keep filled" procedures, this program has resulted in a high saturation of trouble-free heating plants. There are many thousands of home owners who are satisfied with their present heating plants who will be reluctant to allowing gas on their premises, especially when they begin to realize that gas will not be particularly low cost and that it has been the pattern of new gas ventures to raise rates after the promotional period has passed.

The lowest cost residential heating plants in eastern Washington will probably continue to be automatic stokers. To postpone the lighting and holding of fires during the moderate fall and spring months, there has been a considerable amount of manually controlled supplemental electric heating installed. Washington Water Pow-

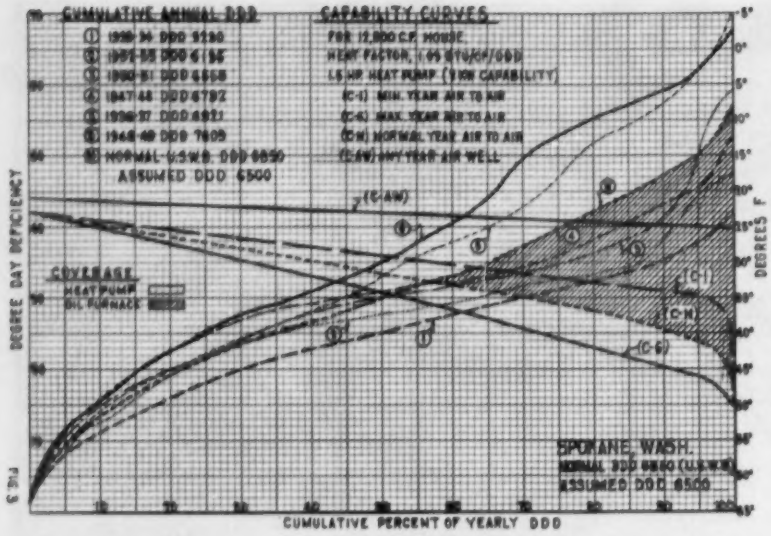


Fig. 3

er has been testing and is now sponsoring a system of automatically controlled off-peak supplemental electric heating, which is applicable to any type of fuel-fired heating system as previously mentioned. It is expected that automatic supplemental electric heating will deter the conversion of many present house-heating systems to natural gas.

All-electric resistance space heating installations are continuing to be made in our service area. The desire of certain people to have the best regardless of cost and the sales activities of dealers handling the many superior lines of electrical heating equipment will always keep this problem with us. In any analysis of future electric utility economics, the relatively low load factor of all-electric resistance heating must be considered. The peak hour on the Water Power system occurs on the coldest day of the year. It is estimated that 10% of this peak results from electric heating.

Growing doubts about the economics of serving future all-electric resistance heating at our present rates have prompted us to investigate various methods of giving our customers the advantages of electric heating on an off-peak or higher load-factor basis. Load-limiting devices with or without heat storage do not appear practical at this stage of development.

Heat Pump Research

Much has been heard in recent years about the heat pump as an electric load builder and load factor improver. In the past two years we have devoted considerable time and money to research that has developed practical adaptations of the heat pump to the climatic conditions of eastern Washington.

In the southern part of the United States, particularly where there are less than 2,500 degree-day deficiencies per year, the heat pump is finding increasing acceptance because an installation can be sized primarily for summer cooling duty and then have sufficient heating capacity to carry the winter heating load for the same space. Farther north, where the capacity for winter heating requirements exceed summer cooling, an auxiliary heat supply must back up the heat pump. If the serving utility has a summer system peak, the use of electric resistance heating for this auxiliary is practical. In climates such as ours where winter peaks can be expected to continue, electric resistance auxiliary heating with heat pumps is highly undesirable. Incrementally it has an extremely low load factor.

Application of the heat pump to the Pacific Northwest has a major advantage in our low electric rate area and a disadvantage in the high ratio of required energy for heating as compared to cooling. In many cases this is more than ten to one. For this reason the heat pump must operate many more hours on heating than on cooling and the efficiency of the heating cycle is of the greater importance. Because the reverse is true in the present larger markets for heat pumps, manufacturers have concentrated on the cooling cycle with the result that most heat pumps now on the market are inefficient from our point of view.

A variety of estimates places the total number of heat pumps in the United States at approximately 5,000. One of the largest manufacturers estimates there will be over a million installations in 10 years. Many electric utility leaders have predicted that the heat pump will be the largest electricity consuming appliance of the future.

There are approximately 70 heat pumps now installed in the three northwest states, mostly where well water heat sources are available. A few atmospheric air heat source heat pumps have been installed by electric companies for experimental purposes. However, their general use has not been encouraged by manufacturers because of their low heating capacity on extremely cold days. Enough atmospheric air heat pump capacity to carry the maximum hour heat loss of a residence would be prohibitive in first cost.

Objectives of Study

The Washington Water Power Co. entered its study of heat pumps more than a year ago with the following objectives, all of which have been attained or are continuing toward successful accomplishment:

1. Promote the basic idea that year-around air conditioning is desirable and worth a large part of the heat pump investment.
2. Determine some of the design criteria for heat pumps especially adapted for heating duty in the Pacific Northwest.
3. Demonstrate that, at our prevailing end rates for electricity, the operating costs of residential heat pumps on heating duty can be as much as 40% less than other forms of heating.
4. Demonstrate by a number of installations of 1½- and 2-hp heat pumps in employees' homes that units sized to carry approximately one-third of the maximum hours heat loss will supply 75% to 95% of the year's heat requirement.
5. Prove that the best type of installation from the point of view of the electric utility and also the customer is a small heat pump with an oil furnace standing by to make up any peaking deficiency.
6. Demonstrate that electric space heating as an auxiliary to a heat pump cannot be served economically by a utility having a winter peak.
7. Encourage the installation of commercial heat pumps using oil stand-by heating.
8. Demonstrate to manufacturers that there is a potential market for small air source heat pumps for residential use in the Pacific Northwest.

In the course of our heat pump studies we investigated the idea of sup-

Table I—Load Factor of Various Heating Systems

Heating System	Annual Load Factor (Based on time of system peak)
Small air well heat pump with oil auxiliary	50%
Small air-to-air heat pump with oil auxiliary	55%
Small air-to-air heat pump with electric resistance auxiliary	12%
All-electric resistance heating	26%

Table II—Heat Pump Calculation Using DDD Curves

Operating Costs	Heat Pump Type Air-to-Air	Air-Well
Heat pump-oil furnace team for a normal year		
Heating kwh	8,540	7,570
Electricity cost/year @ 1.2c kwh	$102	$91
Oil/cost year	18	3
Total	$120	$ 94
Annual cost with all fuel firing @ $1.26 per million Btu	$164	$164
Load Factors		
Total kwh including cooling	8,840	7,870
Average demand kw	1.01	.91
Peak demand kw	1.80	1.90
Annual load factor	56%	48%

plying the heat source for small heat pumps by withdrawing air from an "air well" in the gravel or sand below a residence. We have 16 air wells of various sizes and shapes prepared for testing. We now have heat pumps in successful operation on six of them. On three others we have maintained continuously exhausting fans. Air temperatures from air wells have varied from highs of 55 F to 60 F in the early fall, to lows of 45 F to 50 F around the first of April. Actual withdrawal volumes and temperatures seem to verify theoretical calculations that there will be enough heat replacement from the sun, rain and ground water to supply the heat needs of a 2-hp heat pump from a 15,000-sq-ft plot if the water table is 20 ft or more below the surface. There has been no indication in the tests that the ground air will ever be less than saturated with water vapor. This reduces the air volumes needed, as more than half of the available heat comes from the latent heat of condensed water vapor.

Although some tests were made on smaller wells, the operating air wells are 8 to 14 ft deep, 44 to 48 in. in diameter and lined with hollow concrete block. Negative pressure differentials required to produce air at the volumes needed will vary from .2 in. to 3.0 in. of water. Although air wells dug in sand require somewhat higher vacuums than those in gravel, this differential is partly offset by lower air volumes required from sand wells because of higher temperatures. Air well volumes for the heat pumps now in operation run from 400 to 800 cu ft per minute. The curves shown in Fig. 1 were plotted from actual volume-pressure measurements taken on air wells.

We believe that air wells are as feasible as water wells for heat pump heat sources where conditions are right. Moreover they are somewhat cheaper. The possibility of permanently depressing ground temperatures and of drying out the gravel does not seem likely from the results obtained so far. The advantage of an air well over an atmospheric heat source for a heat pump in Spokane is approximately $35 per year in reduced operating costs. Thus the installed cost of an air well should not exceed approximately $200, otherwise it will take too long to pay it out. All air circulated from an air well must be discharged to the atmosphere because of the possibility of contamination from stray underground gases.

Air-to-Air Units

The practicability of the air well system seems to be established but it will not be available to customers living in clay or solid rock areas. Therefore, we will devote most of our future research efforts to small atmospheric air heat source heat pumps.

Although manufacturers do not seem inclined to express the performance of their heat pumps in terms of COP (coefficient of performance), it is a convenient way of making comparisons with other heating systems. Our air well heat pumps have COPs between 3.0 and 3.5 whereas the COP for currently manufactured air-to-air units designed primarily for southern markets will vary from 1.5 at 0 F to 2.7 to 3.1 at 50 F. Our experience indicates that these figures can be improved by at least 15% by designing primarily for heating duty.

Annual load factor of a heat pump-oil furnace team will run from 45% to 55%. The air-to-air units will perform somewhat better in this respect because of failure to load up on the very cold days. Fig. 2 indicates the relationships of annual load factors for peak day operation of various heat pump and auxiliary heating combinations for a typical house. These can be summarized as shown in Table I.

Obviously, the incremental annual load factor of the electric resistance auxiliary in the third system was less than 2% in order to dilute the heat pump load factor from 55% to 12%. This explains why electric resistance auxiliary peaking for heat pumps is so undesirable from the standpoint of an electric utility with a normal system peak in the winter time.

Because there were no established procedures from which the most economical sizing of heat pump-oil furnace combinations could be calculated, it was necessary to prepare curves from which the proportional heating coverage for a particular heat pump installation could be obtained. Fig. 3 illustrates a method based on cumulative degree-day deficiency curves and corresponding heat pump capability curves. The cumulative DDD curves are general for a particular area but the heat pump capabilities are calculated for each size of pump for each house. Because the DDD curve is cumulative and expressed in per cent of total DDD, a second curve must be used for final calculation to arrive at the number of days in each heating season. The heat pump coverage under the intersection of a DDD curve and the corresponding heat pump capability curve is not measurable directly by area but must be calculated by multiplying the elapsed time by the daily average DDD coverage of the heat pump.

Table II shows how a summary of a heat pump calculation is made with the use of the cumulative DDD curve.

Field tests have substantiated the figures on air-well heat pumps but we do not have enough operation of small air-to-air types to make comparisons. The net effect of defrosting losses has yet to be evaluated.

We are continuing the observations on units now under test and expect to have several improved residential-type heat pumps produced by major manufacturers and installed for additional testing during the coming heating season.

Nine years of brush growth, so thick it was cut prior to basal application early in 1954

All brush was cleared in this area early in 1953. Basal application was made to stumps and new growth in December 1953. In March 1955 all brush was gone from right-of-way. Use of a dye in chemical is helpful

Same right-of-way as shown in photograph above taken a year after brush had been sprayed. There is practically no regrowth from the roots, which were very well established

This clear right-of way is one more example showing efficacy of chemical brush control

Chemical Brush Control Pays

W. D. Skinner

District Manager
Pacific Gas and Electric Co.
Placerville, Calif.

Two years experimentation with chemical brush control in transmission line rights-of-way indicates a substantial saving can be made with this method of control. The experiment was conducted on a 60-kv right-of-way, 18 miles in length, starting in the rolling foothills and extended to an altitude of 3,000 ft. Width varied from 50 to 100 ft, comprising an area of approximately 70 acres.

Two methods of treatment were used, foliage application and basal application. Foliage application requires the complete coverage of all foliage and aboveground brush surfaces with 1½ gal of butoxy ethanol (low volatile) ester formulation containing ⅔ lb 2,4,5-T, plus 1⅓ lb 2,4-D acids equivalent per gallon, mixed with water to make 100 gal of material.

Basal application requires that all sides of the stems from the ground line up to 18 in. be thoroughly wet with 1 gal of butoxy ethanol (low volatile) ester formulation containing 1⅓ lb 2,4,5-T, plus 2⅔ lb 2,4-D acids equivalent per gallon in 24 gal of diesel oil. This same solution is used in the treatment of stumps, which are thoroughly wet until a little solution has puddled at the base.

The basal treatment was preferred for the following reasons:

1. It can be applied at any season of the year, whereas foliage spraying is effective only during the spring of the year.

2. There was less possibility of damaging customers' property adjacent to the rights-of-way, inasmuch as there

is no drifting with this material such as experienced in foliage spraying.

3. Foliage spraying requires the use of larger equipment, which could not be brought within working range of many sections of the right-of-way.

4. Foliage spraying requires a large quantity of water, which is not available in the proximity of most rights-of-way.

The chemicals were applied with 3-gal, compressed-air hand sprayers with all-purpose, medium nozzles. These were preferred to larger equipment that would have to be transported by truck.

Conclusions

These conclusions were reached:

1. If the area to be treated has a dense growth of brush, it is desirable that the brush be cleared off before spraying. It is found that trying to treat these areas prior to clearing is not 100% effective and requires a considerable amount of additional labor.

2. If the right-of-way has been cleared with a bulldozer, a more effective spray application can be made after rains have exposed the stumps that the bulldozer leaves covered with soil.

3. Chemical applications should not be made immedately after or just prior to a severe storm. The solution is more difficult to apply to wet vegetation. Heavy rains will wash away some of the material that has been applied just prior to the rain.

4. A two-man crew with a light truck is the most effective for this work in rights-of-way of 50 to 75 ft in width. The number of men would increase proportionately with the width of the rights-of-way and the terrain in which the work is being done.

5. The use of a dye in the chemical used in the stump and basal spray is very desirable. It enables the workers to determine which of the brush has been treated.

6. With the proper use of chemicals there is no regrowth of existing brush.

Cost of the first application in 1953 averaged $12.51 per acre and required an average of 8.21 gal of material per acre. In 1954 it was found necessary to make the second application in order to treat the brush that had been previously missed. This cost an average of $10.29 per acre and required 5.53 gal of material per acre.

The cost of controlling brush on transmission line rights-of-way has been greatly reduced by this method. Cost of bulldozing a portion of this area referred to in the early part of 1953 averaged $33 per acre. As compared with this, the cost of the two basal applications was only $22.80 per acre.

DANGER—
Radio Ignites Dynamite Caps

Users of mobile equipment inadvertently can be responsible for exploding electric blasting caps. This has been discovered recently in a series of experiments conducted following some accidental explosions that appeared to have been caused by energy from radio transmitters.

Engineers for southern California irrigation districts have been active in investigating the possibility of such explosions being caused by radio transmission and in developing a program of precautionary measures to prevent such accidents.

Interest in the matter followed some accidents that appeared to have been caused in this manner. About the same time they found that the Los Angeles Department of Water & Power had conducted an investigation. The irrigation district has been cooperating with the Pacific Telephone & Telegraph Co. and the FCC office in San Diego in an effort to alert all users of blasting equipment and two-way radio equipment to the danger, and to advise them of measures that may be taken to minimize the danger.

The district has just issued a bulletin addressed to users of mobile radio equipment in the entire metropolitan San Diego area, in cooperation with the PT&T and FCC, setting forth a list of measures that should be taken to avoid these accidents.

It appears that the wires in an electric blasting cap can act as an antenna to pick up radio energy, so that if the configuration of the wires is just right within the vicinity of a radio transmitter the bridge wires in the cap can be heated to explode the cap. This has occurred both accidentally and in test.

Radiated power sufficient to detonate electric caps is transmitted by commercial broadcasting stations and by two-way radio installed in mobile equipment. Many of these installations operate with high wattage 24 hours a day.

The bulletin contains a list of four recommendations made by Samuel B. Morris, general manager and chief engineer of the Los Angeles Department of Water & Power. They are:

1. Electric blasting caps should not be transported in cars with two-way radio.

2. They should only be transported in their original container and none should have their wires extended.

3. All cars with two-way radios while within 300 ft of any electric blasting operation should have the transmitter turned off.

4. Only a nonelectric blasting method such as blasting cap and fuse, or primacord with blasting cap and fuse should be permitted if within two miles of a commercial broadcasting station.

Revision of the State of California Construction Safety Code dealing with this subject is under consideration at the present time. The main parts of this proposal are:

No. 1721. Electric blasting in proximity with radio stations—(a) Keep electric blasting caps and conduct electric blasting operations at distances from operating radio transmitters and antenna equal to or greater than those shown in the accompanying table. This table does not apply to radar or international broadcasting equipment which, because of high energy intensity, ordinarily require even greater distances; (b) At distances less than shown in the table electric blasting shall be avoided. Blasts may be detonated by means of a nonelectrical method such as blasting cap and fuse; (c) Electric blasting caps are not to be transported in any vehicle equipped with a radio telephone or other radio transmitter, *unless they are still packed as received in their original container or are in a metal-covered box.*

Safe Distance Table

Station Power	Minimum Safe Distance From Radio Antennas and Transmitters
0 to 29 w	100 ft
30 to 99 w	200 ft
100 to 249 w	500 ft
250 to 999 w	1,000 ft
1,000 to 4,999 w	2,000 ft
5,000 to 50,000 w	5,000 ft
More than 50,000 w	10,000 ft

Issuing of numerous items of line hardware to jobs from bin stock without requisition effects large savings in accounting costs

Line Hardware Requires

No More Requisitions

Harry L. Clark, Assistant General Auditor, Portland General Electric Co.

Late in the fall of 1953 Portland General Electric Co. accounting employees suspected they were working too hard to account for small-cost, multiple-use items of distribution pole line hardware such as are listed in the accompanying table. Each lag screw, line bolt, washer, etc., as it was purchased, processed into and out of the storeroom, detailed on each work order estimate, and placed in the property ledger was being meticulously recorded and accounted for as an individual item. After such accounting, the lag screw, bolt, washer, etc., lost its identity and became a part of the unit price of the cost per foot of pole or per foot of wire. What had been accomplished? How could the procedures be changed to achieve the same result without all this work?

The work order estimate sheets were prepared by line department estimators to show a description of the work and a detailed listing by accounts of all material required. After being approved, a copy of the estimate sheet was given to a clerk who then prepared the stores requisition by again listing the materials showing accounting distribution, quantity required and a brief description of each item.

A multiple-line stores requisition and a multiple-line return to stores ticket for unused or salvaged items was being used. Each item for every job was separately listed and processed through the storeroom. The stores accounting records were being maintained on IBM punched card equipment so that individual issue cards were prepared for each individual item on each transaction, and separately listed for a record of net issues from stock, again separately listed for the *all source* record that supported the accounting distribution. It was evident from this that the accounting costs exceeded by a considerable amount the base cost of the stores items. The problem was to find or devise a system that would eliminate the excessive paper and clerical work and still insure good inventory control.

The first step in arriving at a solution was to analyze approximately 75,000 individual issues and returns of pole line hardware for the year 1953. It was found that almost invariably these items, used on every line job, were charged or credited to a single plant account or the related maintenance account. It was also found that the major portion of the 75,000 individual issues represented repetitive issues of only 125 small-cost items.

Arrangements were then made to clear from the stores records a working stock of these items by charging such stock on regular stores requisitions to the predetermined work order estimates and accounts as indicated by

this analysis. The working stock was labeled "bin stock" and was physically separated from the balance of the stores items called warehouse stock.

The bin stock then became free material inasmuch as the storekeepers would issue the required numbers of any items of this stock as indicated on a job sheet and would not demand a requisition. As needed, the bin stock is replenished from warehouse stock on regular requisitions in standard units (25 or 50) or multiples thereof which are likewise charged to the predetermined accounts.

Any items of bin stock in quantities less than standard units required for work other than normal distribution line work, such as for substation work or transmission line work, are listed on special stores requisitions. These requisitions are stamped *special* and after being processed by the storekeepers, independently of regular stores requisitions, are forwarded separately to the machine accounting section. Individual issue cards are prepared for these items, then the cards, after being priced and extended, are listed on a journal entry voucher in which the appropriate accounts are charged and the bin stock predetermined accounts are credited for the values of the material.

Items of bin stock in quantities equal to standard units of 25 or 50, or multiples thereof, which are required for work other than distribution line work, may be issued from the storeroom by either of the following methods: (1) such issues may be made on regular stores requisitions in the normal manner or (2) they may be made from available bin stock on a special requisition.

Items in Bin Stock

Bolts, carriage
Bolts, double arming
Bolts, eye
Bolts, machine
Bolts, upset
Braces, flat
Brackets, riser
Breakers, guy
Cable, guy
Clamps, grooved
Clamps, guy
Connectors
Dead ends, automatic
Dead ends, preformed
Eyes, bolt
Fuses, link
Hooks, guy
Insulators, dead end
Insulators, pin type
Nuts, eye
Pins, SS, pole top and stick
Plates, guy
Screws, lag
Sleeves, Compression No. 4 and No. 6
Sleeves, guy serving
Steps, pole
Washers, curved and square
Wireholders, porcelain

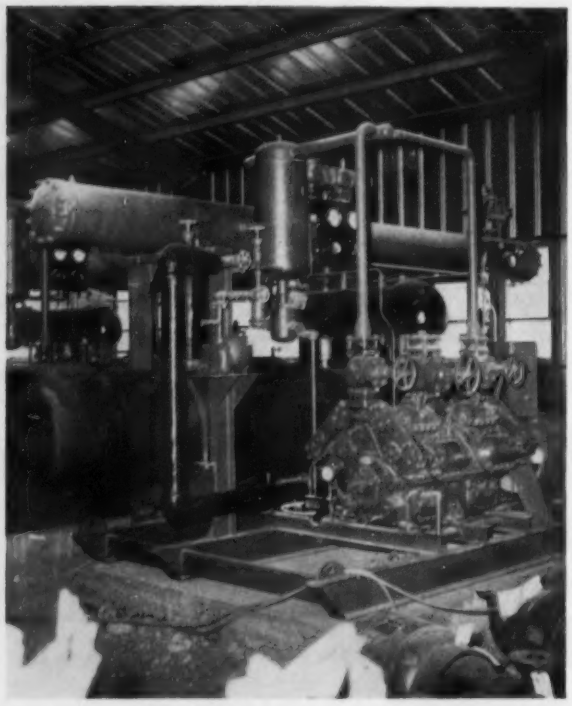
Savings Effected

What has been gained? Lines of writing on stores requisitions have been reduced by one-third or by about 8,000 to 10,000 items per month. Likewise the IBM issue cards have been decreased by 8,000 to 10,000 each month with a consequent saving of punching and processing time on high-cost machines. Preparation of the month-end stores and accounting reports has been speeded.

The elimination of 8,000 to 10,000 individually listed items from the operating records has greatly simplified such records and speeded analysis work. The work of the storekeepers in accounting for unused or salvaged material has been considerably reduced. Formerly all such material, including thousands of pieces of pole line hardware now classified as bin stock, was checked against a returned to stock ticket. Now all usable bin stock material is returned directly to the bin without a stores record entry. The monotonous counting at inventory time of thousands of nuts, washers, bolts, lag screws, etc., has been discontinued. As a result, the company has been able to utilize in more productive work each month approximately 275 to 300 clerical man-hours, 40 key punch hours and 8 to 10 tabulating machine hours. However, the storekeepers still retain physical control of bin stock and, like all inventoried materials and supplies, it is not available to the operating crews until it is issued by the storekeepers.

The procedures adopted by Portland General Electric Co. were accepted by the accounting staff of the state regulatory commission and are operating to the satisfaction of all of the employees affected by the change.

First aluminum to be produced in Montana was recently poured at Anaconda Aluminum company's new $65,000,000 plant at Columbia Falls with fitting ceremony. First carload of aluminum was shipped Aug. 25. A second pot line went into production late in August, with the third and fourth scheduled for operation by mid-November. Russell B. Caples, president of Anaconda Aluminum, said the plant was built to be expandable. It will reach full production of 120,000,000 lb a year about Jan. 1; will employ 450 persons with annual pay roll of $2,000,000. Currently the plant is producing only 10-lb pigs, will later turn out 6-ft bars and sheets



A drilling rig sinks holes to bedrock, left, that will contain pipes carrying freezing brine from six compressors like one pictured

Big Freeze Will Form Cofferdam

Work has started on the ice cofferdam that is an interesting feature of the construction of Seattle City Light's Gorge Dam on the Skagit River.

Contractors Merritt-Chapman & Scott Corp. and Savin Construction Corp. are drilling the 6-in. holes that will contain circulating pipe for the freezing solution. It will be, in effect, a tremendous refrigeration system to freeze underground water to form the cofferdam.

Engineers decided to use the ice-dam method when test drilling revealed that the site was a "pocket" in the river bed reaching to depths of as much as 200 ft in spots. It had filled with a mixture of sand and gravel and boulders that made a conventional steel sheet-pile cofferdam impractical.

The big job of freezing the underground water will be done by 80 holes of various depths containing casing and a 3-in. pipe enclosing a 1½-in. pipe. The smaller pipe reaches to within six inches of the bottom of the hole at bedrock and the 3-in. pipe will be capped at the bottom. The freezing solution will circulate down through the small pipe and return through the space between the two. The holes may be connected in series by hoses from one to the other, but this has not yet been decided.

The brine supply and return headers are 8-in. steel pipes.

Six York Corp. freezing units with a total capacity of 250 tons are provided by the contractor for the project. All six units will be operated on maximum brine cooling load when freezing each cutoff wall, but fewer may be required to hold the freeze when it is once made. Capacity of each unit, cooling 167 gpm calcium chloride brine to –10 F, is 42 tons. Total brine flow is 1,000 gpm.

Surface water will be partly controlled by the present Gorge Dam.

Additional water control will be gained by a number of 12-in. holes upstream from the dam site. These will have pumps drawing water up and away from the ice dam to ease the freezing burden.

The second phase of construction will call for the drilling of 70 more holes to freeze under the opposite side of the river channel. This will take place after the concrete work on the first part of the permanent dam is nearly complete. Part of the overflow section will be left low to carry stream flow while the remainder of the dam is being built.

Besides the ice, the second phase will also require a crib on top of the frozen portion in some parts of the cofferdam.

Gorge Dam itself will be about 275 ft high, but it is not a water-storage dam. Its purpose is to provide a 100-ft higher head of water for the existing Gorge power plant, which is to be enlarged. Water storage takes place at Diablo and Ross Dams upstream. They are also owned by Seattle.

Because the new dam is to be built in two stages and some of the construction requires shutting down the intake tunnel, the project will be done over a period of several years to take advantage of seasonal water and power demand changes. It will probably be completed about 1959.

The extensive changes are expected to add about 47,000 kw to the plant's capacity and will cost about $15,000,000. The project includes a new highway between Gorge and Diablo plants.

As to bidding

What Am I Doing Wrong?

Bid monkey wrenching is the evil of the day. Despite the best boom in electrical business since old-timers remember, there is sharper bidding and shadier practices after the bid than even desperation would account for. Everybody is in the act so no branch of the business is without sin.

Realizing that a start must be made somewhere to restore some integrity to bids and relationships between suppliers and contractors and each other the Rocky Mountain Chapter of National Electrical Contractors Assn., in Denver, has put it in writing. The chapter issued a statement of policy to spell out to its members what was the decent thing to do. Then it sent copies of it to all suppliers so that they too could refresh jaded memories as to what they in turn should be doing if they are to expect any improvement in the situation.

Everybody gives lip service to these principles and declares something should be done about it—meaning the other fellow. But this spelled out what each one can do himself.

Recently Don Larson, manager of the chapter, had occasion to emphasize the seriousness of this policy to a big national manufacturer whose violation of integrity on an important switchboard bid was enough to make the whole industry of the region lose faith in that company. Another copy of the statement of policy was sent to the representatives of that company with a letter making an honest appeal for help in correcting a situation hurting the industry.

"We know that reasonable adherence to these principles can mean much to all suppliers. No one can deny that they make sense," he wrote. "We know that our people (contractors) have made this situation possible by unfairly pitting one against another—many times after discovering that our bids were too low. All we ask is that you do your part and help us get away from a very bad practice injurious to all of us."

Underlined (in italics below) were the paragraphs of the policy statement in relation to fair bidding practices.

"Art. V—Follow fair bidding practices: Any act which restricts fair competition is a betrayal of trust. True competition can accomplish its purpose only when it operates in an environment of mutual respect, good faith and honesty as outlined hereafter:

"Sec. 1—The qualified contractor should not publicly criticize a qualified competitor nor pass judgment on his work or charges.

"Sec. 2—The qualified contractor should neither seek nor accept information regarding a competitor's bid or price prior to opening of bids or closing of nonbid transactions.

"Sec. 3—The qualified contractor *should consider his bid final and not to be altered after bids have opened.* When substantial changes in requirements truly justify a change or when further bidding on alternate items is requested, the contractor should bid only on items specified and should change the amount of his bid only to the extent of the increase or decrease in the cost of the alternatives involved.

"Sec. 4—The qualified contractor who is not the low bidder should refrain from soliciting such work on a percentage or cost-plus basis after bids have been solicited and received by the owner or general contractor on a lump-sum basis.

"Sec. 5—The qualified contractor who did not submit a bid on the job at the time bids were first called for should refrain from soliciting or accepting the work on any basis after bids have been received.

"Sec. 6—The qualified contractor *should not invite proposals from suppliers from whom he has no intent to purchase, as the supplier has a right to expect his figure to be used if it is low.*

"Sec. 7—*The quoted price of a supplier should be accepted as a trust and should not be revealed to a competing supplier nor be used in any way to secure a lower offer.*"

The opening paragraphs of the policy statement sets forth the basic principle upon which the policy is based. Certainly it is one subscribed to by all in the industry.

"The only justification for the existance of any private business is service to the public. Integrity, fairness and the intent to provide high quality public service must be the paramount consideration of every contractor in the conduct of his business.

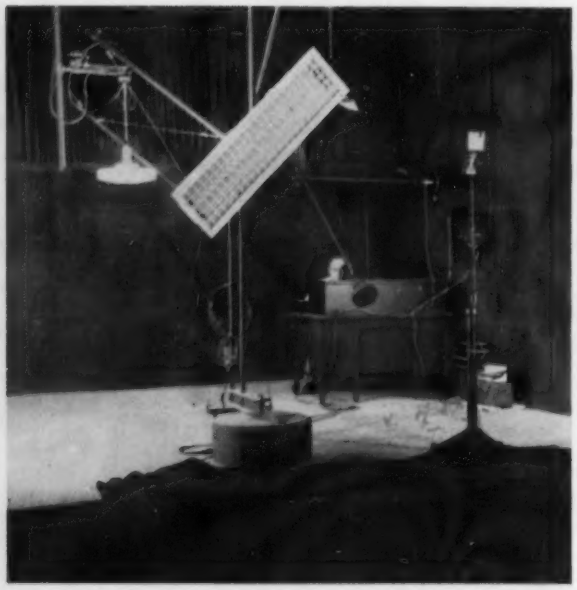
"The contractor's ability to provide adequate service is dependent upon the soundness of his business. The contractor's legitimate profit is as vital to the public as it is to the contractor himself, for as it sustains his business it sustains his ability to serve adequately his customers."

The policy statement then goes on to say that the members of the association adopt the principles enumerated in 13 articles, of which that on fair bidding is Art. 5. The others cover the upholding of codes and safety standards, observing principles of sound management, using factual cost data in making estimates, giving customers the NECA guarantee for the work performed. It cautions against doing business with general contractors who engage in bid shopping. It suggests charging for estimates where desired for purposes of information or checking. It has paragraphs covering unsolicited bids, plans and specifications being sufficiently complete and time allowed for a careful estimate. The final provisions cover traveling contractors, complaint procedure and bid registration and use of the bid depository. A final article states the member's obligation to participate in association affairs and sharing in its promotional aims.

An appeal to decency is the complete purpose of the policy statement. In case the recipient may have become fuzzy in his thinking as to just what is decent and honest, it is spelled out to remind him. With more observance of these principles, not only in Denver, but throughout the West and the nation, the booming electrical business can again hold its head up in self-respect.

• **When Congress reconvenes** another concerted effort will be made by National Electrical Contractors Assn. and other mechanical trades to get the Federal Construction Contracts bill on the floor for vote. Known as S 1644 the bill passed the Senate and now goes to the House Judiciary Committee. It is designed to prevent bid shopping and peddling on government contracts. Although it has been fought strongly by the general contractors' associations many of its members would welcome it, surveys show. It is written to return to the government any benefit the general contractor may obtain by bid shopping. Many Western states already have such laws or call for segregated bids on state work to protect the subcontractors from exploitation by bid manipulation.

Author Bill Jones, research engineer, at photometric control desk. Cell mounting and incandescent photometer rotator on wall above



Test apparatus: fluorescent test stand in foreground, incandescent photometer in background, both equipped to rotate fixture tested

Sets Up Own Photometric Lab

Lighting is bettered because of research. Chiefly such research is conducted by manufacturers of lamps and equipment. Of late a few universities have equipped themselves to do so. But Western manufacturers of lighting equipment operated on too small a scale to afford the facilities for such research. They relied heavily on data developed from eastern sources. Even the testing was farmed out to distant laboratories.

One Western manufacturer to establish a well qualified laboratory, both for testing of its product and for basic research for the public good, is Smoot-Holman Co. of Inglewood. Its facilities, illustrated here, are described by Bill Jones, its research engineer, in the following:

1. General lab facilities—The laboratory section devoted to photometric testing is about 40 ft long, 20 wide and 12 high. The ceiling is open joistwork. All walls, the ceiling and the floor are painted flat black. In addition, the floor is covered with black cloth whenever tests are being run. The photometric section is separated from the remainder of the room by a black, opaque curtain.

2. Fluorescent test photometer—The fluorescent photometer utilizes a vertically rotating, motor-driven goniometer with automatic indexing at selected angles. Calibration is by means of a lamp calibrator, which is lowered from the ceiling and positively positioned by the goniometer. Lamps are calibrated simultaneously with barriers between to eliminate interreflections.

The test distance used is 40 ft, which is achieved by reflecting the light from a 5-ft square mirror placed 20 ft from the goniometer and into a cell placed near the goniometer. The cell is well shielded to eliminate direct light from the fixture and stray light from the remainder of the room. Positioning of the fixture under test is carried out with spirit levels and a sighting tube, to insure accuracy of angular measurement.

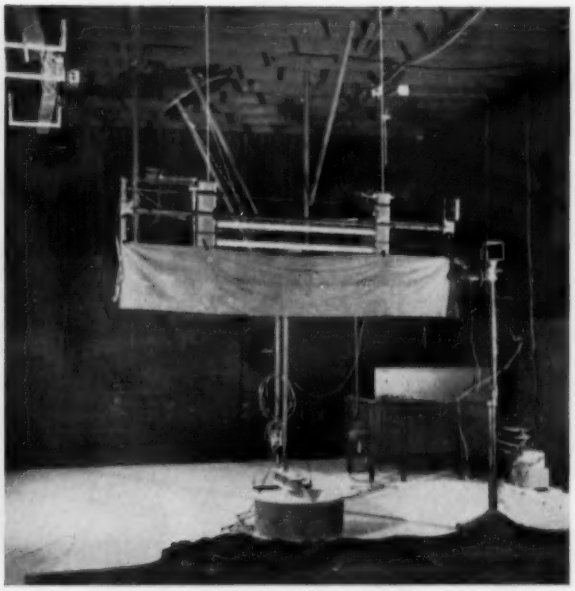
Fixtures are tested by the IES recommended method, with the ballasts mounted in the fixture. The fixture is placed in normal operating position for calibration with the lamps in the calibrator operated from the ballast in the fixture. After calibration the lamps are placed in the fixture and allowed to stabilize. The ambient temperature is maintained constant within 2° for each test and all tests are conducted within a temperature range of 80-85 F. After stabilizing in normal operating position, the fixture is moved into test position and a reading taken immediately of the end-on candlepower. The fixture is then allowed to stabilize in the test position and the reading adjusted to the end-on candlepower. The test run is then made. All candlepower data are adjusted to the manufacturer's rated lamp output.

3. Incandescent test photometer—The incandescent photometer utilizes a horizontal rotating, motor-driven beam that carries a photocell and a 27-in. mirror. The test distance is 15 ft, allowing for testing of fixtures up to 36 in. in diameter. The fixture is supported on a rotating mount, which is rotated at 73 rpm to average out variations in lamp output. Calibration is achieved by use of calibrated lamps. The swing of the mirror is 5 ft, with the remaining 10 ft of test distance being from mirror to photocell.

4. Metering—All photocells feed through a selector switch into a Rubicon null-type current balance, equipped with measuring dials with a total scale length (0-100) in excess of 115 in., and a reading accuracy of one part in 10,000. The cell operates into zero resistance when in a balanced condition, eliminating all cell fatigue and consequent reading error. Current for the balance is obtained from batteries and is monitored by a milliammeter. No change in battery current has been observed over any test.

Voltage is maintained constant by means of a Stabiline voltage regulator,

View from cell location to mirror for 40-ft testing. Black cloth on floor reduces any stray light reflections. Ballasts in fixtures



Lamp calibrator in place, cloth shields fixture during calibration with fixture in normal burning position following IES procedures

which maintains the voltage constant with 0.1% of the setting. Setting is achieved by a 2-kva powerstat with a range of 0-135 v available.

5. **Brightness measurements**—Brightness is measured by use of a color-corrected cell in a black lined box, with a 1-sq-in. aperture and a viewing distance of 18 in. The cell feeds into an Ayrton shunt and associated sensitive galvanometer. Total brightness range is approximately 6-600,000 f-l. Calibration is by comparison with standard lamps and is checked by a Luckiesh-Taylor brightness meter.

A set of lamps of all commonly used sizes and types is maintained for photometric use. Lamps are calibrated and aged for constant output.

6. **Purpose** — The main purpose of the laboratory is to provide engineering data on Smoot-Holman fixtures, for the use of the sales and engineering departments. All proposed fixture designs are tested during the design procedure to see if anticipated performance is achieved and what effect changes in design have on performance.

The equipment is also used to test production fixtures, to perform quality checks and to investigate the effects of production changes.

The engineering data obtained are put on standard engineering data sheets and issued to sales personnel, architects and engineers. Abridged data are published in the catalog.

The laboratory results are checked periodically against those run on the same units by independent laboratories, to insure accuracy of data. Correlation within 2% is regularly maintained.

One of the major advantages of the laboratory is the rapidity with which information can be made available to customers.

The equipment flexibility of the lab makes possible many other kinds of tests, such as heat and fixture component tests. Facilities are available for a large amount of basic lighting research, some of which is planned and will be carried out when time permits.

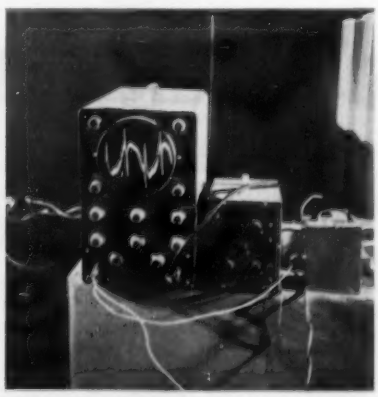
7. **Accessories and outside laboratory facilities**—A well-equipped workshop is located in the same room (behind the curtain). In this shop designs are translated into "mockups" for test and modifications made as suggested by test results.

Under preparation at this time is an outdoor laboratory for floodlighting tests and other tests requiring long distances. This consists of a grid pattern about 50x100 ft in extent with a 20-ft scaffold for floodlight mounting. Provision is made for voltage control of lamps and facilities for extension of metering and control facilities to the test area are being made.

Other equipment for various types of test includes an oscilloscope, electronic switch, various amplifiers, shunts and photocells, pyrometers, light meters, brightness meter, test stands, decades, reflectance standards and calibrators.

It is hoped also to contribute research data to Illuminating Engineering Society committees as it develops.

Brightness measuring apparatus enclosing cell which feeds into galvanometer on table, equipped with shunt for constant loading



Wide-band oscilloscope, electronic switch and amplifiers used to check stroboscopic effect, ballast currents, radio interference

First Security's 12-story office building

Main floor bank area lighted by groups of four 4 x 4-ft, flush-mounted ceiling fixtures

Other floors have lighting troffers in parallel rows; air diffusers between rows

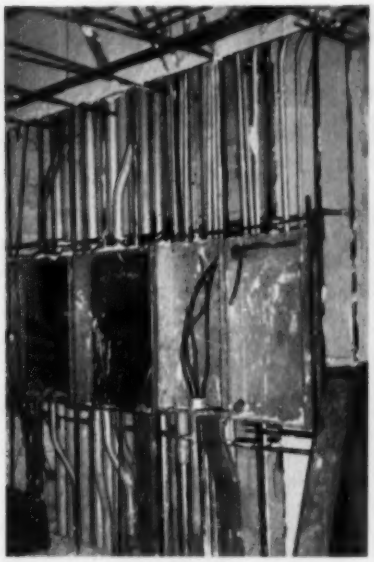
Bank floor has underfloor duct grid system

Bank Builds Salt Lake Tower

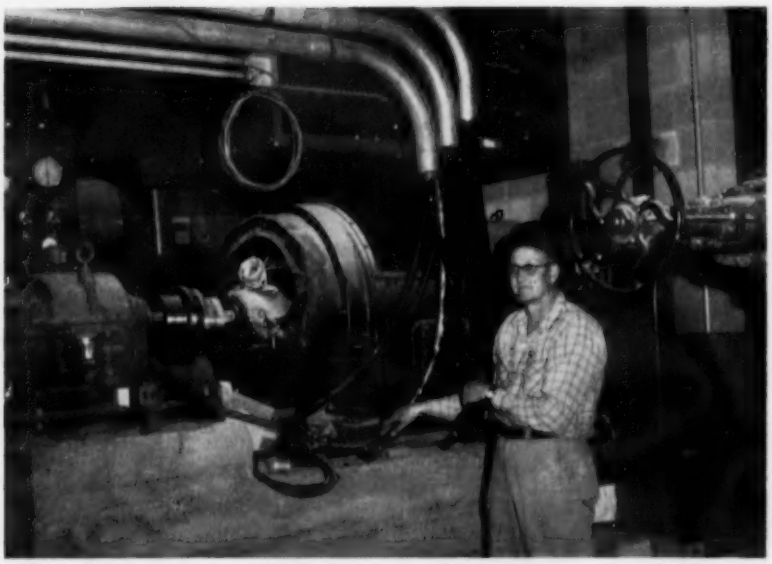
Like many growing Western cities Salt Lake City has a new skyscraper, the first since the late war. It is the new 12-story bank and office building built by the Eccles brothers, Marriner and George, for their First Security Corp. as headquarters for First Security Bank of Utah, N. A. It was designed in a modern pattern of steel and glass by W. G. Knoegel of the Bank Building and Equipment Co., architects, Slack W. Winburn, associate architect, and W. Sarmiento, designer. Construction was by Utah Construction Co.

In spite of its modern "skin-type" design, the electrical system is conventional, although the electrical contractor, Wasatch Electric Co., endeavored to have the architects consider a 480/277-v system. The use of a conventional 120/208-v system necessitated special treatment for the heavy air conditioning load. The entire building is winter and summer air conditioned, two systems being used, one for the bank area in the basement, first and second floors, the other for the office building above.

Power is taken from a Utah Power & Light Co. vault in the street at 120/208 v, three phase, four wire by means of a bus duct through the retaining wall to a main panel at that point. A short run of 3-in. conduits carrying three 500,000 MCM per leg is made to the power panel immediately in front of the specially designed 400-amp, 208-v motor, served in a similar man-



Light and phone panels grouped together



Air conditioning compressor motor requires paralleled heavy conductors for 400 amp, 208 v

Bus duct from street vault to main switchboard; conduit runs to distribution centers

Air conditioning and power board adjacent

ner from the circuit breakers. Capacity of the air conditioning compressors is about 400 tons. The same power panel serves other motor loads in the basement.

Feeders are run from the main board to the elevator penthouse in the tower and for blower motors and pumps for the air conditioning equipment in the tower.

Lighting throughout is done by troffers in the ceilings. Day-Brite units using 48-in. rapid-start fluorescent lamps are run in parallel rows on each floor except the bank main floor. Movable steel partitions or walls are used to suit the office space requirements of the tenants. A pattern of air conditioning vents is used between the rows of lighting units. Thus light and ventilation are available everywhere no matter what the space arrangement may be. All switching of lights is done at a group of panelboards for lighting, telephones and underfloor duct office machine power circuits, located in the elevator lobby. Local thermostatic control of air conditioning is provided, but not of lighting.

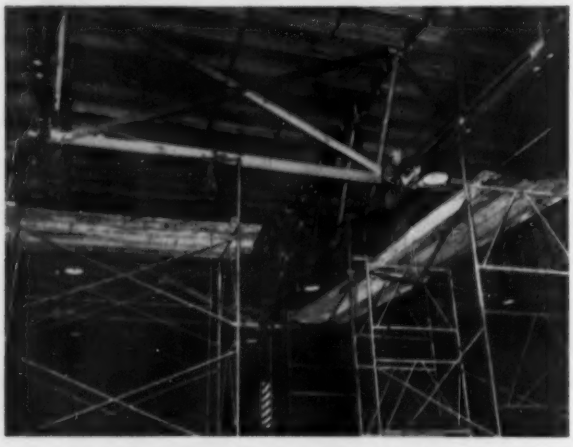
Lighting in the ceiling of the bank floor is done with a pattern of groups of four 4x4-ft Day-Brite troffers covered with Corning pattern 70 hobnail diffusing glass. Similar glass is used on the units in the upper floors. Footcandle levels range from 50 to 100.

Some of the other electrical features include a large neon sign on the tower, installed by Young Sign Co. The glass doors of the bank are electronic push button operated. Elevators are designed for automatic operation. A National Electric Products underfloor duct system provides easily accessible channels for telephone and office machine power practically everywhere.

The building was 17 months in construction. It was dedicated late in August although portions of it had been occupied prior to that.

Electrical installation was supervised personally by the several Forsberg brothers who own Wasatch Electric Co. Their foreman was Herman Lund (in picture above).

As the first major building since the war it touched off other building projects in the area, among them an addition to another bank, several branch banks and other commercial structures.



Prefab Cuts High Time

- **Conduit runs on trusses before lifting in place**
- **Movable scaffolds for fixture wiring**
- **Portable motorized tool bench**

Work done at considerable height above the floor is premium time work, whether or not the scale calls for extra pay. It always requires difficult handling of materials, extra safety precautions and nonproductive up and down time. So an approach to installation of warehouse lighting that minimizes the time worked at any height is a cost advantage. Schwartz & Lindheim, Oakland electrical contractors and engineers, had such an installation to make for a new 120,000-sq-ft warehouse at the Port of Oakland erected to house a cotton compress and to warehouse cotton. The job was accomplished in spite of rain, cold and darkness last winter in a minimum of time.

Tilt-up concrete slabs made the walls of the building on which were placed trusses of wood construction fabricated on the ground and lifted in place. It was decided to install the conduit, boxes and pull in the wire for the lighting circuits while these were on the ground. Top picture at left shows electricians fastening the precut lengths of pipe and boxes to the bottom cords of the trusses. Second picture shows them in place and the wire pulled in and coiled in the boxes.

After the building had been assembled and the roof put on, wiremen then mounted the portable pipe frame scaffolds to install the fixtures and connect the lighting circuits to the horizontal feeder conduit runs up the end walls from the switching panels. The third picture shows electricians mounting fixtures and making connections from them to the circuits in the pull boxes. A switch run of conduit can also be seen down a column center.

Because 40,000 sq ft of the warehouse were to be used for cotton compressing, an operation releasing much lint into the air, the location is classified as Class III, Division 1, hazardous location and dust-tight, explosion-proof RLM fixtures and accompanying switch panels and wiring methods were required. In the remaining 80,000 sq ft used for storage of bales, regular RLM 500-w units are used.

To bring the reflectors even with the bottom cord of the trusses the contractors redesigned the system. A gooseneck of conduit was run up from the conduit and over the bottom of the truss so that the fixture could be supported on the other side just even with the lower cord. This placed fixtures at a 20-ft mounting from the floor rather than 30 ft usual in warehouses, where the trusses themselves interfere with distribution of light. A special welded bracket holds the gooseneck conduit and fixture firmly. Detail of this is shown in the bottom photo.

Another cost-saving device was a mobile workshop, pictured on the cover of the magazine. On a mobile trailer, used as a work bench, a gas-operated generator was mounted to power tools, lights, and a power threader and portable power band hack saw. It was moved with the work and saved walking and time and labor.

The remainder of the electrical installation was typical of that used in warehouse buildings where little or no conduit is run in the floor slab and walls are of tilt-up construction. The class of construction makes exposed conduit fastened to the concrete acceptable. Hence home runs from the panels were made in that manner. In order to keep them out of the way as much as possible, however, they were kept high, coming down to panels and to the main switchboard.

ELECTRICAL WEST

Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

Want new region

A drive to have NECA establish a new and separate district for California and Nevada was launched at two recent California Conference of NECA Chapters' meetings in Santa Barbara and Oakland. It is linked with the desire many members have expressed for the national association to finance a special field representative to sell the luminous diffusing systems (ceilings) through electrical contractors rather than carpenters. In fact a program to finance such a man is being considered by the various chapters, who would contribute, based on membership dues. The program now broadens to include legislative or any activity where needed to guard electrical contractor and IBEW jurisdiction. The separate district proposal missed the deadline for submittal as an amendment to be voted on at the national convention in New York Oct. 28, but it may be discussed there.

Boiled over

Santa Rosa tilted up the wage scale for the Bay Region when NECA Redwood Empire Chapter and IBEW agreed on a 25c an hour increase, making the scale $3.45 for journeymen, the highest in the Bay Region. Others foresee it as the fulcrum of a lever to raise all others in the region to the same level or higher. Thus general desire grows for an area-wide agreement to cover the region. The health-and-welfare program is now conducted in that manner for uniformity.

Busy still

Construction activity continues high as the fall season starts. Most areas of the Pacific Coast report shortages of men, at least good ones, and all contractors are busy. Even with the vacation period over, there seems to be work enough for all qualified electricians.

Copper quivers

The copper price situation took a breather after its two jumps late last month that sent all price lists into the wastebasket. Copper's rise was reflected in increases in a wide variety of devices and fittings. The steel price likewise had an effect. Higher wage rates among the manufacturers is also a factor. The price increase brought sobering of bidding and considerable stability to the wire market.

No controls wanted

NEMA's wire and cable section faced up to its problems at a Sept. 26-28 meeting in Pennsylvania. William A. Meissner Jr. of the Department of Commerce copper division told them: "It is increasingly apparent that the entire copper situation can be summed up in one word—price. There is sufficient copper physically available to meet requirements but there is not sufficient low-price copper to meet them. This administration does not favor price controls nor do we believe that you do. We believe in free enterprise in the scheme of things and the fact that your competitor is able to obtain more 43c copper than you is a matter over which we have no control."

White hope

Aluminum as a conductor received new impetus in the thinking of the manufacturers. Its suitability for magnet wire and building wire, particularly, were explored.

Wire rule changes

Speaking of wire, the proposed changes in the 1956 National Electrical Code include a rearrangement of the section relating to wire and cable, plus proposals for a section on temporary wiring; a new heat-resistant, rubber-insulated wire (type RH-90) for use at 90 C; establishment of maximum temperatures for copper and aluminum conductors; tables for current-carrying capacity of insulated aluminum conductors. A new moisture- and heat-resistant thermoplastic insulated wire (type THW) for use at 75 C is under consideration.

Settle quarrel

Apparently the luminous diffusing system jurisdiction may be settled in the San Francisco Bay region as a result of joint meetings among labor representatives of both the IBEW and the carpenters, electrical contractors, acoustical contractors, fixture manufacturers. It boils down to electrical contractors and wiremen installing luminous plastics and supports that are used for the lighting and carpenters the adjacent acoustical tile. Common supporting T-bars may be installed by one or the other, depending on the general

design of the installation. To prevent work stoppages, jobs outstanding as of Oct. 5 were being listed and cleared.

How many circuits

Built-in appliances are causing inspectors concern, particularly where the cooking top and oven are apart some distance. Inspectors favor separate circuits to provide fuse protection for the separate units. Many also favor disconnecting plugs so that if homeowners change their own heating elements they can disconnect before doing so.

Too compact for comfort

General Electric's packaged kitchen, complete with a circuit breaker panel designed also to carry house lighting circuits as well as one for each of the unit appliances, has met opposition from inspectors who object to the panel location so near the water-pipe-connected disposal unit. G-E has agreed to compromise on 1956 models, embodying only circuit breakers for the appliances themselves.

Sorry!

Evidently we erred in the report regarding nonreturnable reels in a recent issue. It is Rome Cable Corp. that has the nonreturnable policy and is understandably proud of it. If wire makers follow the leader as lamp manufacturers do, others will likely do so.

Moths to the flame

More recruits to the pink lamp brigade were noted again this month. Westinghouse Lamp Division calls it "Beauty Tone." . . . Duro-Test calls it "Candlelight." Fashion magazines show bucket hats returning to women's heads too.

Ready soon

Day-Brite's new plant at 530 Martin Ave., Santa Clara, expects to be in production this month, according to Matt Cabot, Western regional manager. Dedication of the new plant is planned for Nov. 5. It is a complete assembly and finishing plant for Day-Brite lighting fixture products for the Western region.

Beckon Westward

A move to get the 1958 national convention of National Association of Electrical Distributors in San Francisco was started at the zone convention in Victoria. It will be the golden anniversary of the wholesalers' association, which appropriately might be held "by the Golden Gate in '58."

Disaster

Royal Electric Co. of Pawtucket, R. I., announced that its Manville plant had been destroyed by fire, necessitating concellation of all decorative Christmas lighting, fuses and wiring devices until the plant could be rebuilt. This did not affect the Pawtucket plant, which produces wire, cord sets, etc.

None here

Superior Electric Co. at Bristol, Conn., however, announced that it had not suffered any damage to its plant production because of recent floods and that there is no delay in delivery schedules.

Replace

Los Angeles Chapter, NECA, decided to tear down the old mansion it has occupied at 24th and Broadway, Los Angeles, and build a new two-story office building on the property, leasing the ground floor and occupying the second floor for its offices.

How do they do?

Wire and Cable Users Committee, under the California Division of Industrial Safety, will soon make its final report. Recheck of data during summer months, under higher ambient temperatures, is being made before the final report is rendered. The survey did not bring to light any great number of failures of cables in service, some in operation as long as 30 years.

End their duty

Several oldtime inspectors expect to retire soon. First is Harry Dobson, chief electrical inspector, Santa Barbara, who retired Oct. 1. Jesse J. Hutchins, senior electrical inspector for the County of Orange, at Santa Ana, expects to retire Jan. 1. So does Ben Wheater, chief electrical inspector of Long Beach, early next year.

Explore potentials

General Electric's Power Forum returned to Salt Lake City under the sponsorship of Utah Power & Light Co. Sept. 19. A full day's program combined talks from General Electric people, including W. H. Mott, manager, user industry sales, Salt Lake City; F. W. McChesney, manager, light manufacturing and service industries department, Schenectady; D. L. Beeman, manager, engineering planning section, Schenctady; K. P. Grenfell, system application engineering section, Schenectady; J. J. W. Brown, manager of materials handling, Schenectady; Dale Brown, area representative, Lamp Division, Salt Lake City; J. E. Johnson, manager of service shops department, Salt Lake City; N. F. Barnes, manager, public relations, G-E Laboratory, Schenectady. UP&L speakers included W. A. Huckins, manager of business development department; J. E. Cushman, vice president; W. L. Shaw, industrial director; and D. D. Moffat Jr., vice president.

For hot locations

A tentative interim amendment to the 1953 National Electrical Code recognizes silicone-insulated fixture wire, type SF. Changes to Sec. 3102, 4144, 931010E and Table 3, Chap. 10, are made to permit it. The wire is limited to 300 v and operating temperatures up to 150 and 200 C are permitted.

One winner

Fourth place in the national "My Most Interesting Lighting Job" contest of Illuminating Engineering Society was won by the South Pacific Region's winner, Gordon Dovey, Southern California Edison Co., presenting the relighting of Paper Mate Pen factory. Other Westerners honored at the convention in Cleveland were C. D. Gibson, California State Department of Education, School Planning, who was made a Fellow, and Jerry D. Whitnell, Arizona Public Service Co., Phoenix, who began a two-year term as regional vice-president.

Council cases

New wage scales have also been decided by the Council on Industrial Relations in Seattle and in Imperial County of California. In Seattle, after a long deadlock in negotiations, the Council decided to increase journeymen's wages 10c an hour to $3.10 with an additional 6c an hour added to the present vacation 6c an hour beginning Jan. 1, to provide an additional week's vacation. Agreement was between Puget Sound Chapter, NECA, and IBEW No. 46 . . . The Council rendered a decision which raises the hourly wage rates for Imperial County in jurisdiction of local 47 to $3.35. It is a 15c-per-hour increase to all classifications across the board, effective Sept. 3.

Incentive to hire

San Francisco Electrical Contractors and Local No. 6 agreed to an important change in the apprenticeship agreement. Prior to this, employers of apprentices had to send them to school during working hours and pay them for that time. Under the new agreement apprentices will go to school on their own time but an effort will be made to keep all apprentices employed. Under the past agreement, many contractors were reluctant to do so.

Under a cloud

Utah contractors anticipate stormy labor negotiations with local unions 217 and 354, which began this month, because of the confusion over application of Utah's right-to-work law and the high wage pattern set by the plumbers. The plumbers obtained high rates through strike action, both in Utah and Idaho where electricians' negotiations will begin Dec. 30.

Aimed at old homes

Sacramento has a home wiring modernization program underway, sponsored by the Sacramento Valley Electric League backed by the Municipal Utility District, local contractors and dealers. In cooperation with the local banks, financing plans are advertised in large-space ads in local papers offering the booklet "Electricity in Your Home Plans" and free wiring inspections and estimates from contractors participating. Where leads come to the league itself, a committee handles the prospect distribution.

Managers exchange

Wiring figures prominently in the deliberations of the International Association of Electrical Leagues, composed of the managers of electrical promotional organizations throughout the country, which met in Toronto Oct. 5-8. W. F. Lovelace, manager of residential sales, Department of Water & Power, Los Angeles, talked on "Sell the Wiring—Appliances Will Come Automatically." Western league managers participating included J. R. Dooley, secretary-manager, Electrical Service League of B. C.; Glen L. Logan, Electrical League of Los Angeles; J. Clark Chamberlain, Bureau of Home Appliances of San Diego; and Ralph B. Hubbard, Rocky Mountain Electrical League, Denver.

Defines the limits

Jurisdiction over all electrical work above the low-voltage control in connection with furnace installations, kitchen ventilation fans, air conditioning motor installation and hook-ups, as well as the setting of lighting standards in filling stations and parking lots is claimed by local union 302, IBEW, in Contra Costa County. A letter was sent to all electrical contractors by Thomas J. Ryan, business manager, detailing exactly the jurisdiction claimed for electrical workers . . . Similar action was taken by the local union in San Jose in regard to installations of built-in electrical appliances.

Chapter aide

Joseph T. Krivanek Jr., son of the proprietor of a pioneer electrical firm in Longview, Wash., has been named assistant chapter manager of the Northern California Chapter, NECA, working with Ernest Kramm, manager.

Hot business

A National Industrial Electric Heating Conference, sponsored by the council, is scheduled for Feb. 6-10, 1956, at Netherland Plaza Hotel, Cincinnati. The council has also prepared a metal sheath electric heater course that is available to utilities or other groups for local courses.

Approved at last

Los Angeles city's new electrical code, in preparation almost four years, finally was adopted by the city council and becomes effective Jan. 1. Because of its size an authorized publisher was named, the Building News, 5616 San Vicente Blvd., Los Angeles 19. Copies cost $4 . . . EMEA of Southern California was polling its members to see if they were interested in a 6-week code class on the new code.

To improve small shops

Simplified lighting layouts for various types of small merchant's establishments in the Los Angeles area are being worked out by the lighting division of the Department of Water & Power under Ted Sheppard. These are used by the all-purpose salesmen of the department in their calls upon these various types of merchants. They can also be used as a visualizer to talk from and contain a floor plan on which to make a rough layout. Where a complex situation is found, the specialists from the lighting division are called and they make detailed lighting layouts. The program began with four types of business: liquor stores, stores to rent, ready-to-wear stores and offices. Meetings with the general-purpose salesmen were held to acquaint them with the use of this promotional material.

Launched

A Certified Lighting program for industrial, commercial, office and school occupancies is being started in the Los Angeles area. A new organization was set up to handle it, although it may later be linked with the Los Angeles Electric League.

About people

Had you heard that—Dick Gates has been made Pacific Coast conduit sales manager for the Rome Cable Corp., with his office at the Torrance plant of the company. In the past, his responsibilities have been in the Los Angeles area but in the new job he will cover the entire West . . . Robert A. Young has been appointed southern California representative for Superior Switchboard & Devices Co. of Canton, Ohio . . . James H. McCulloch, at one time Sunbeam Lighting research man and recently with General Electric Lamp Ballast Division, has now established his own testing laboratory, Independent Testing Laboratories, at Boulder, Colo. . . . A. H. "Bill" Gudie, president, Biddle Trade Publishing Co., addressed a wholesaler group in Denver Oct. 11 and later is to speak to a similar group in Kansas City. . . . John L. Busey, former Californian and Montanan, who retired from General Electric Co. last fall after being G-E Supply Co. president for 15 years, is now a director of the Miller Co., Meriden, Conn. . . . Jake Imhof, manufacturers' representative, dropped the Miller line in the Los Angeles area . . . Bill Jones, Smoot-Holman research engineer, has been recommended by the Southern California Section, IES, for membership on two national committees, (1) the design practice committee and (2) testing procedure for illumination characteristics. He was formerly consulting engineer in the San Francisco area . . . Andrew Hannon, Hannon Engineering Inc. of Los Angeles, will address the AIEE construction design committee at its meeting Oct. 27 in Edison company auditorium. He speaks on "Some Engineering Aspects of Sound Systems." He has also organized a panel of contractors and engineers for a discussion of mutual relationships for the same organization in November . . . Roy Peck, formerly of Electrical Materials Co., started his own company in Arcadia . . . Jim Shirreffs has changed the name of his manufacturers' representative business from Valley Specialties Co. to Jim Shirreffs Co. . . . Tom Sullivan of General Electric Co., Los Angeles, has been transferred to Chicago for a new promotional residential load building program . . . Fred W. Carlson, Seattle manufacturers' representative, has moved to a building of his own at 1201 Dexter Ave. from 2307 Fifth.

Mourned

Death came to two well-known persons—Herb W. Parsons, pioneer electrical contractor in Los Angeles, died early in September . . . Cliff Dorwin, executive director of Oakland Builders Exchange and well known to electrical contractors' groups, died suddenly Sept. 27.

Modules standardized

An interesting development is reported by the American Standards Assn. The research institute of the National Association of Home Builders and **House and Home** Magazine held a round table with executives of leading manufacturers of home appliances and kitchen cabinets and recommended adopting a 2-ft module for kitchen dimensions, as well as standard counter height, cabinet depth, clearances, etc. Two large manufacturers are to announce the standardization on the 24-in. modules. Also discussed were easy connections to gas, electricity, water and drainage and means to plug in the wiring.

If it's done for termites, why not

Preinspect Before Home Resale?

A way to reach the old house and to correct its unsafe and homemade wiring extensions has always been a difficulty for the electrical inspector and contractor. Wiring codes give inspectors authority to inspect new construction and to pass upon the safety of the wiring installation before premises are occupied. But, once lived in, the rule that a man's home is his castle prevents any reinspection unless it is invited.

Pondering this problem and the contrasting inspection for termite infestation, John R. Thompson, Berkeley city electrical inspector, came up with an approach that both the Northern California Chapter and then the Southwestern Section, International Association of Electrical Inspectors, have endorsed and intend to publicize widely. It is perhaps the most constructive public relations action developed by that organization in recent years.

The idea is to apply the same procedure to houses about to be sold to a new purchaser that now applies in termite inspection. And it can be carried on voluntarily, without new legislation and with an existing governmental body to watch it in California.

In the presentation of the idea to the inspectors Thompson gave this reasoning:

"With the increased usage of electric appliances and because of the 'Do it yourself' publicity, many additional hazardous conditions are being created by home owners. They do wiring of a sort without first obtaining a permit and having it inspected, either because of ignorance or neglect. When the house is sold these hazards remain in the house. The new owner, who probably has dug up every cent he can scrape up to make the down payment and move in, needs a new appliance installed. This requires a new circuit and inspection. We inspectors are called to the house and we find other violations.

"When we call the new owner's attention to these infractions his reply is, 'The previous owner must have installed them. Why should I be held responsible?' We inspectors do have hearts and feelings, believe it or not, and we feel sorry for the man because we have to demand that the new owner correct these conditions for his own good."

What Thompson proposes is that the inspectors' association officially recommend to the realty boards, their individual directors and members in each area, as well as to their associations, a program of examination of electrical conditions in a house before it is sold. This examination can be performed by a licensed electrical contractor and paid for by the purchaser, just as termite inspection is. Any work to repair or correct hazardous or illegal wiring would be paid for by the seller. The plan is entirely voluntary, without legislation or enforcement agencies or extra cost. Lending agencies might require such examination and correction of wiring before granting new loans, as is the practice with termite inspection.

In summary the plan would call for:

1. Examination of house about to be sold by a state licensed electrical contractor. Policing of the contractor's ethics and charges would thus be under the State Contractors License Board, an existing governmental body whose law gives it supervision over business practices of contractors with respect to the consumer.

2. Electrical contractors would receive a fee, probably from $7.50 to $15 depending on the size house and complexity. This would be paid for by the purchaser.

3. The contractor can give an estimate of the cost of making the repairs, to be done at the expense of the seller.

4. The request for such examination would be voluntary on the part of the realty agent and buyer.

5. A statement showing the electrical permit number from the enforcement agency would be rendered the buyer after repairs are made and inspected.

Several questions were raised when Thompson first presented the plan. These and the answers to them follow:

Question: Should not the inspection be made by an electrical inspector?

Answer: No. Most inspection departments do not have the manpower to devote to this work. They cannot possibly cover all the ground. Besides they cannot give an estimate of the cost of repairs.

Comment: In some cities inspectors do examine premises when the service is discontinued.

A: Perhaps so, but many times the owner and realtor continue the service in order to show the house at night and electric service is not stopped.

Q: Does the house have to be rewired to present standards?

A: No. Only the violations need to be cleared.

Q: Does the old or new owner have to have the work done?

A: No. He can sell it as is if the buyer wants to buy it as such but at least the new owner will know what he is buying.

Q: Does the seller have to have the repairs made by the examining contractor?

A: No. He can get as many estimates as he wishes and have work done by a contractor of his own choosing.

Q: Has seller or buyer any recourse regarding either the workmanship or cost of repairs?

A: Yes. Through the State Contractors License Board.

Everyone will benefit from such a program, Thompson explains. The realtor will sell a "clean" house, without violations. The new owner will inherit no violations from the previous owner. Fire departments and insurance companies will reduce potential fire causes. Inspection departments will get corrections of bad wiring not otherwise discovered. The utility will have nonmetered losses discovered and corrected.

Farmstead Wiring

Considerably upgraded standards for wiring of farms is recommended in the revised edition of the Industry Committee on Interior Wiring Design's 48-page manual, "Farmstead Wiring Handbook." It complements the "Residential Wiring Handbook" published last year. Some of the changes include:

Service entrance panels 200 amp or larger; conductors no smaller than No. 2 copper or No. 0 aluminum; all branch circuits in farm buildings 20 amp; minimum wire size for branch circuits No. 12; provisions be made for new farm uses such as milking pits, automatic feeders, silo unloaders, hotbeds, heat lamps over drinking and feeding areas.

The handbook has sections on interior design, outdoor distribution and tables for wire sizes. Copies are obtainable from the committee, 420 Lexington Ave., New York, at 50c.

ELECTRICAL WEST

How Political Propaganda Is Made

"I AM the chairman and I make the rules." That statement at Idaho Falls by Representative Earl Chudoff (D-Penn.), who heads the Congressional subcommittee investigating federal power policies, is indicative of the lack of fair play that characterized committee sessions held in the Far West. At Denver and at San Francisco, the tactics, the witnesses, and the questioning followed the Idaho Falls pattern—discredit if possible the administration's power policy and make political hay for 1956.

Virtually all of the witnesses were public power people. Only in San Francisco where an attempt was made to infer that there was something devious and suspicious about Pacific Gas and Electric Co. relationships with Interior Department personnel, did private power company people testify. In almost every instance testimony was slanted to infer that public agencies were being discriminated against and the preference clause was being ignored by officials of Interior. And at no time were any witnesses representing that department called to testify.

While not unprecedented, this ignoring of the accepted principles of democratic procedure is both irresponsible and deplorable. It is indicative of the ends to which political propaganda will be stretched to influence a national election.

Let's All Sell *Now*

LONG-RANGE outlook that national income, capital expenditures, home building and consumer purchasing power will remain at present high levels is excellent. All branches of the electrical industry have the capacity to handle a large volume of new business. The stage could not be more ideally set and the time more propitious for an intensive sales drive in the march toward the all-electric home.

General Electric Company's "Live Better Electrically" promotion could be the spark to rally the industry for a selling program unequaled by any other industry. G-E naturally has a self-interest but asks no identification in promotional material that will be furnished at cost. It will take its chances in sharing new business created. It does ask, however, the full support of other appliance manufacturers and of all branches of the industry, particularly the utilities.

Eight thousand dollars are in sight as the average worker's annual income, the 25,000-kwh all-electric home is in prospect and electronics is ready to revolutionize electrical living. Conditions are right and the time is right for an all-out selling program. Will the industry wholeheartedly get behind a national drive? Will it miss a golden opportunity? We hope not.

There's a Parallel With Oil

THERE are many parallels between the oil industry and the electric industry. Both deal with a natural resource; both are large; both are complex; both have many segments; and both vitally affect the public interest. So there is more than just a word of warning for the oil people in what the president of the American Petroleum Institute, Frank M. Porter, recently told his membership. Paraphrase a word here and there, and his sound advice might have been directed to the components in our own business. Here is what Mr. Porter said:

"Looked at philosophically, not as a lawyer defines it, the oil industry is an integrated operation beginning with the search for raw material and ending with delivery of the finished product to the consumer. Whatever our individual endeavors may be, we are all of us in the oil business together. Not one of us as an individual—not one of us as a functional group—is capable of operating effectively without the others. We are all interdependent. But because the oil industry has grown to be of such enormous size and has become so specialized in its varied operations, the component parts of the industry tend to become autonomous and isolated in their thinking. And there lies the danger."

For more than twenty-five years, electrical industry leaders, ELECTRICAL WEST and its

EDITORIAL VIEWS

national contemporaries have been repeating this same warning to our industry. Had it been heeded in the beginning, many of today's toughest problems and perplexing relationships would not exist.

We hope the oil industry takes Mr. Porter's advice to heart. And it still isn't too late for the component parts of the electric industry to fill the vacuum that exists in many of their relationships.

The Battle of the Built-Ins

A REVOLUTION in building is going on, one that can best be capsuled as "the battle of the built-ins." Not only does it apply to domestic appliances but to lighting, both domestic and commercial. And because it *is* made a part of the structure the installation crosses traditional jurisdictional lines. So does the sale—either of lighting or of appliances. That means it is both an internal and an external battle—a dog-eat-dog fight.

How Many Subdivisions of Load?

NO OTHER subject, unless it is grounding, stirs so much argument as the "six subdivisions of load" provision in the National Electrical Code. And probably nothing has as many ingenious schemes devised to include under it more and more switches by use to tie-bars, "close-proximity" contentions, connecting handles, etc.

At the time it was introduced it was to permit the multibreaker panel of six circuit breakers as the main disconnecting means for a house. But meanwhile most houses have outgrown six circuits and the pressure has been on to increase the limit to eight, then 12, even 24. Many inspectors have backed up on the whole thing and now insist on a main disconnect ahead of everything.

A group of 20 inspectors in the Northwest Section, IAEI, held a bull session over the whole question and decided that the six limit was nonsense so why not admit it and take off all limitations for residential use. A resolution to that effect was passed at the convention the next morning. It is being transmitted to the other sections for their approval.

The Southwestern Section did not concur, however, although it continued to complain about the attempted evasions of the rule by panelboard makers and contractors. At least the dramatic move on the part of the Northwest inspectors has focused attention on this question and that should result in a reconsideration of the whole involved complex situation.

You Can Say That Again

"*SOCIALISM has demonstrated four facts over and over again: (1) You can't multiply wealth by dividing it. (2) It does no good to get rid of a few little monopolies by creating a big one called 'government.' (3) The government can't give away what it does not first take away. (4) It can never take away enough to supply the ever increasing demands of those who are led to believe they are getting something for nothing when they get it from Uncle Sam. If we want to be a free people, we must begin to do what we ought to do because we ought to do it and not just when we are forced to it. This demanding that we be forced to be good before being willing to behave is the root of much of our trouble. Burton Parks in 'Better Homes and Gardens' put it this way: 'We'll never reach maturity in America until we get over the idea that whatever is legal is also moral.' No people can long maintain their freedom unless they are morally worthy of it. The only alternative to the imposition of controls from without is the exercise of controls from within. The only alternative to being forced to do what we ought, which is a form of slavery, is to do what we ought because we want to—and this is the only basis on which freedom can be built.*"—Kenneth W. Sollitt, from an article in *Christian Economics.*

ABC...and the Reader

BACK IN 1914—forty-one years ago—a group of advertisers, advertising agencies and publishers joined in a project that has come to mean a great deal to the millions who, like you, read business magazines. The project, initiated at a time when circulation claims were rarely verified, was intended to achieve and maintain higher standards of integrity in publishing and advertising practice by providing means to audit paid circulation. Out of that effort came an organization known as the Audit Bureau of Circulations, a voluntary, non-profit, cooperative association, known for short as ABC. Its symbol appears at the head of this page.

We are proud that McGraw-Hill publications were among the founders and charter members of the Audit Bureau of Circulations.

Today the Bureau numbers 3,670 members. These include advertisers, agencies, and publishers of newspapers, farm papers, general magazines and business journals such as this one. These publisher members hold their memberships and their right to display the ABC symbol in their publications only so long as they live up to the circulation standards that are established through the Bureau.

It is one thing to set up high standards; it is another to see that those standards are maintained. This latter and all-important function is performed by a staff of auditors maintained by ABC to check periodically on the circulation practices of the publisher members. When a business magazine, such as this one, joins the Bureau it agrees that the ABC auditors shall have "the right of access to all books and records." Their inspection may dig into the files of original subscription orders, payments from subscribers, paper purchases, postal receipts, arrears of payments, editorial expenses and many other significant items. Sometimes the auditors go behind the records and seek verification of purchase and payment from subscribers themselves.

The information thus obtained and certified by the Bureau then becomes available to the public and constitutes an authoritative report on the publication's circulation practices.

The advertisers and agencies benefit directly from the ABC because it provides a generally recognized factual yardstick by which the circulations of member publications can be measured and appraised. Every paragraph in an ABC report on a business publication gives the advertisers data that help them make intelligent use of the publication as an advertising medium.

But the ABC renders a service of vital concern to the *reader* as well. The Bureau audits paid circulation only, and it is through this payment, whether by subscription or newsstand purchase, that the reader keeps the editorial policy of a publication responsive to his needs. His decision to buy or not to buy records his judgment on each publication, and the ABC-audited and certified circulation reports make the sum of these judgments known to all concerned.

So the editors of ABC publications must constantly keep their editorial services up to the mark if they are to survive a competition in which the reader's right to buy or not to buy is paramount. Each paid magazine or newspaper will prosper or fail as it wins or loses the voluntary patronage of thousands or millions of readers. And—the ABC is scorekeeper in this vital contest.

Thus the publisher who submits his publication to the supervision and discipline of ABC affirms in the strongest possible manner his recognition that his primary obligation is to his readers and that he owes the standing of his publication to a voluntary demand by those readers.

All this is what makes the ABC brand on a publication so important to its readers. That respected symbol, testifying to the advertising value of the publication, serves also as a constant reminder to all concerned that the reader's willingness to pay for an ABC publication is the basic reason why it stays in business.

McGraw-Hill Publishing Company, Inc.

Industry asked to unite in promoting

Electrical Living

A program to unite the entire electrical industry in what it hopes will be the greatest mass market development program ever launched is being proposed to electric utilities by General Electric Co. The idea, the company said in its announcement, stemmed from a belief of President Ralph J. Cordiner that a new and integrated effort is needed so that the full potential of the residential electrical market can be realized.

As described by Roy W. Johnson, executive vice-president, before the Rocky Mountain Electrical League last month, this "Live Better Electrically" program would make available a sizable national backdrop of manpower, promotional tools and public information quite apart from the company's continuing product promotion.

The material would have no G-E identification, he said, and would be available at cost to utility people and their natural allies, electrical contractors, builders and others. The company wants and urges other electrical equipment manufacturers to join in on the program and furnish materials for it, he emphasized.

One of the first components would be a program guide, suggesting ways in which electric utilities can invite the support of contractors, suppliers, lending institutions. Later the company plans an information program for utilities containing tips and ideas for local action as well as successful load building case histories gathered from across the country.

In early January 1956 a nation-wide closed-circuit telecast will go into every important city in the United States. This telecast will be financed by G-E, Johnson said, but without company identification and will feature national personalities. It is hoped, he continued, that the telecast will trigger all-out efforts to prepare for local action; that in each locality the utility will act as sponsor, issue invitations, handle publicity and generally play host.

A few days after the telecast, he suggested, the utility might consider making a personal detailed follow-up presentation to all its allies. This meeting would give an opportunity to discuss a local plan of action and a time table of activities.

Just before the actual launching of the utility local programs, the company plans to sponsor a nation-wide television spectacular on a Sunday evening. To be provided for utility use are (1) a customer home planning guide, 36 pages in color, giving information on recommended wiring, the complete electric kitchen, indoor and outdoor lighting; (2) *Meet Mrs. Swanson,* a 27-minute full color Live Better Electrically motion picture.

An advertising program would promote benefits of all-electric living in national consumer magazines and would cover all areas that tie in locally with the theme. The program would be put to work also in G-E's own product advertising.

Johnson prefaced his announcement of the program with a summary of the broad economic outlook for the next ten years, including forecasts for $500 billion of disposable income and average worker income rising to as high as $8,000.

He also told the new things to come immediately and in the future, using the slides presented elsewhere in the West last month. A cordless electric clock and high-frequency electronic oven will be placed on the market within the next six months, he said. In the more distant future there will be such things as machines that wash clothes by supersonics with no mechanical rubbing, radiant canopies that fold out from the bedroom wall to take the place of blankets, wall-mounted dishwashers. Scheduled for production in 1957 is a heat pump 60 in. long, 30 in. high and 27 in. wide, about one-third the present size of a 2-ton model. To be in production by the same date is a 1-ton heat pump for individual room use.

Eternal vigilence, flexibility are

Keys to Successful Freezer Plan

Flexibility and eternal vigilance are musts in a successful food freezer plan, in the opinion of Paul Du Pont, manager of the major appliance division of Walker-Scott Co. in San Diego. His opinion is backed up by the current promotion of his department, which was started Aug. 22 after careful study and by Sept. 15 had netted a sale of 20 units at an average of $550 each.

In the first place the plan must be tailored to the individual family, Du Pont believes, and it must be accompanied by an educational program to teach the household to budget itself, to control its appetite. Food is planned on a six-month basis and, wherever possible, it is advisable not to deliver it all in one shipment, he says.

Walker-Scott offers various programs based on the amount the family is paying per month for food without a freezer plan. The freezer is sold with nothing down and 30 months to pay. Food is financed through a personal bank loan, with recourse on processor.

Eternal vigilance and close supervision of salesmen are necessary to insure proper conduct of a freezer plan promotion, Du Pont emphasizes. In the Walker-Scott plan, the customer signs a form to let the store know that she has not been high pressured. If a follow-up discloses dissatisfaction or a reluctance to go through with the contract, the customer is told to think it over and the freezer is not delivered.

There is no hurry, Du Pont points out. "This should be considered plus business. It takes hours to make a sale and, unless the customer can benefit from the purchase, everybody loses."

The store handles the Ben Hur freezer and has exclusive franchise in San Diego County. At the end of the first month it had the original team—six men and a supervisor, plus four telephone people. The salesmen are experienced in food freezer plans.

The area is particularly well suited to such a promotion because many of the Navy wives work; need the convenience of a freezer plan. However, because the purchase is frequently made while the husband is away from home, there must be extra vigilance against high-pressure methods and careful supervision, Du Pont insists.

Cost of the sales program is high, he says, but not excessive if it continues to get results.

• **As part of its "Farm Better Electrically" program** Utah Power & Light Co. in cooperation with the Utah State Agricultural College conducted a dairy farm tour starting at Preston, Idaho, and ending at the experimental farm in North Logan, Utah. W. A. Huckins, manager, Business Development Department, and D. L. Holt, residential and farm director, arranged the tour.

Frosty Raymond (at microphone) tells how advertising and promotion will fan sales

Before the meeting President Ivan Lauritzen (second from left) talks with three guest speakers: C. W. (Web) Theleen, G-E; Walter L. Forward Jr., FHA; John K. West, NBC

Dealers are promised

Marketing Garden of Eden

A bright future for dealers who are willing to work and to use time-tried selling fundamentals was unfolded by speakers at the annual fall conference of the San Diego Bureau of Home Appliances in Balboa Park Hospitality House on Sept. 14. As another tribute to the bureau's long-standing reputation for fast-moving, idea-packed conferences, some 400 attended the dinner program despite the fact that unseasonably high temperatures of the day persisted into the evening.

Arranged under the chairmanship of Robert Covell, R. L. Covell Co., the program included year-end reports and installation of officers by the bureau as well as pertinent messages from industry and civic leaders. Retiring President Lee Bornstein, Lee Distributing Co., and Incoming President Ivan Lauritzen, San Diego Vocational School, with the aid of the bureau's green-and-red-light speaker's signal, kept the meeting going at a fast pace. More than one speaker paid tribute to the bureau's activities and to its secretary-manager, Clark Chamberlain.

Good and Getting Better

Good times, good products and willing customers with disposable income will provide a marketing man's Garden of Eden during the coming decade for major appliance dealers who see their opportunities and are willing to work, C. W. Theleen, manager of customer relations for General Electric Co.'s Major Appliance Division at Louisville, told the group.

To back up his premise, he made these points: The economic climate is good and will be delightful. Major appliances have been good and are getting better. The "average guy, your customer," is earning $4,800 to $5,000 a year; in a decade may be earning $10,000. Purchases are at a high level now and the outlook for the decade is "wonderful to say the least." Gross national product and disposable income are up and are expected to go higher. Predictions are that California's population will have increased 40% by 1965 to make it the most populated state in the union. More money is being spent for research. We have a federal government with an enlightened attitude toward business.

The businessman can take advantage of all this but he will have to recognize that the major appliance business today is not as it was 20 years ago, Theleen stated. It is big business now.

A renaissance of design, with built-ins and color, is accentuating obsolescence; making possible new concepts and decorative freedom. All manufacturers have terrific plans on their drawing boards, he said, and showed slides of some G-E products to come.

The house of the future, he said, will require only a single fuel—electricity. A central packaged heat exchanger will furnish all heat and cooling requirements from zero freezer temperatures to those required for boiling.

There is a success formula, Theleen believes. "If you are going to be big, you have to act big, you have to be important to someone." He urged dealers to concentrate their energies by handling one full line or at most two lines, instead of many competing brands. Repetition helps impress; continuity helps to sell, he reminded. "Take a look at Sears-Roebuck."

Be dynamic, accept the new, believe, and success will be yours, he concluded.

Construction Boom

Pointing to the fantastic movement westward, Walter L. Forward Jr., Federal Housing Administration director for San Diego County, said that predictions are for a 20-year construction boom. As an indication of stability, he pointed out that the average buyer of a no-down-payment home as of July had $900 in the bank.

Factors that will cause the housing market to be maintained, he believes, are: (1) families who can afford to buy are increasing twice as fast as housing is increasing; (2) savings are increas-

ing steadily; (3) birth rate continues high. Mortgage credit will be in ample supply to support this market, Forward thinks, even with recent tightening.

We are in a community that has not reached peak of capacity in any way, he said, and cooperation between his agency and the appliance industry will bring an excellent future, he predicts.

The Little Things Count

A review of the selling fundamentals was urged by Gordon Boyle, vice-president and general manager of O'Keefe & Merritt Co. Four things, he said, will defeat apathy and add up to sales: (1) know the product; (2) find out what the customer wants; (3) make an enthusiastic and coordinated presentation; (4) develop better closing techniques. "It is the little things that count in selling," he reminded.

Bureau Program

In a presentation that used an ingenious paste-up and a light touch to make an impressive array of facts and figures most palatable, F. M. Raymond, San Diego Gas & Electric Co. advertising manager, and bureau advertising advisor, told how the two organizations spent a quarter of a million dollars in 1955 to fan the flame of appliance sales.

Because people, like generators, need a prod, the bureau inaugurated its sales training program, Norman Anderson pointed out in introducing Walter Thatcher, principal, San Diego Junior College and Vocational School, who presented Certificates of Merit to those who had completed the course. Effectiveness of this activity has brought inquiries from all over the country, it was pointed out.

Folders were distributed describing the associate in arts degree for the appliance industry, developed by the bureau and San Diego college.

Bob Ennis, General Electric Co., outlined the bureau's plans for National Radio and TV Week, which was to open a local promotion continuing through October. A hard-hitting advertising program includes cartoon-type ads; offers incentives to dealer readership.

New officers and directors were installed by E. W. Meise, San Diego G&E, first president of the bureau. Ivan Lauritzen, radio-TV-electronics instructor at San Diego Junior College and Vocational School, succeeded Lee Bornstein, Lee Distributing Co., as president. Other officers: first vice-president, Jerry Heilbron, Heilbron Electrical Co.; second vice-president, Ed Nystrom, Nystrom Bros.; treasurer, Sam L. Hall, Electric Supplies Distributing Co.

Chamberlain Michaels West

What's the Status of Color TV?

Although it won't come overnight, mass production of color TV sets is well on the way. This was brought out in a panel discussion that was one feature of the San Diego bureau conference. Dr. E. L. Michaels, chief of advanced development, Packard-Bell, and John K. West, regional vice-president, National Broadcasting Co., were the experts. J. Clark Chamberlain, bureau secretary-manager, was moderator, ably pinch-hitting for R. T. Silberman, president of Kay-Lab Corp., who was called to Washington at the last minute.

Briefed the questions and answers went something like this:

Q: Have manufacturers and networks been dragging their feet?

A: Everybody, not only one facet of the industry, has been dragging feet. However, there is no longer any excuse for it.

Q: When did the industry begin to develop color TV?

A: In 1948. Principal problems were search for a satisfactory tube and a definition of compatability.

Q: What have we done in the last couple of years?

A: Quite a bit. The equivalent of a 21-in. tube has been developed, components have been simplified and the cost has come down.

Q: How does the network schedule compare with last year?

A: NBC had 31 hours in September, more than five times the number it programmed the same month in 1954. It plans to program 40 hours a month. CBS has announced a color schedule of 20 hours a month. There is, of course, a difference between what is on the network and what will be seen on the West Coast.

Q: Have problems of filming color shows been licked?

A: Many commercials are on color film and are beautiful; color film can be run. It is also possible to record and hold live shows.

The present 21-in. three-gun tube will be the one to be used in the foreseeable future. It is available and satisfactory now.

Q: How about color studios? Will color by-pass San Diego?

A: There will be a good schedule of spectaculars, sports and other color programs on the West Coast. There will also be 1½ hours of color during the business hours and it is hoped that dealers will use this time for demonstration.

Q: Are we going to do any better with set production?

A: The reason there is not more production is that circuits are being simplified. Gradually they will be simplified more and more and new components will be less and less expensive. This fall most manufacturers are going ahead with a certain amount of production.

Q: What happened to the first single-gun tube?

A: It will not be used by most manufacturers because it is inherently difficult to make and is not commercially available now.

Q: How about the cost of color shows?

A: Cost of color shows is not more than 15% above black and white. There is no increase in time cost and no increase in number of engineers required. More lighting is needed, however. The problem is to invest enough in facilities so that more shows can be done in color. Initial investment in color studios is tremendous, running as high as $3,500,000.

Q: What is being done to push this along?

A: NBC thinks that the day is not too far off when all programming, and presumably all receiver manufacture, will be in color. One prediction is for 65,000,000 TV sets in the U. S., 60% in color, by 1965. Another is for 92,000,000 sets, 90% in color, by 1975.

Dickerson Dulfer

Hegarty Anger

Packard

Appliance dealers find that

Clinics Show the Way to Profits

How to get more customers into dealer stores and do a better selling job after they are there was considered at Profit Clinics in San Francisco, Sept. 20, and in Seattle, Sept. 21. The San Francisco meeting was sponsored by the Bay Area district, National Appliance and Radio-TV Dealers Assn., the one at Seattle by the Northwest Appliance and Television Assn.

A traveling team of guest speakers from NARDA was supplemented at each clinic by local industry leaders. The headliners who appeared in both cities were: Mort Farr, Upper Darby, Pa., NARDA board chairman; D. A. Packard, New York, senior market analyst for McCann-Erickson and former Kelvinator sales manager; George Johnston, president of Johnstons Inc., Minneapolis retailer; T. O. McDavid, Baltimore, vice-president of Commercial Credit Corp.; E. J. Hegarty, Mansfield, Ohio, director of sales training for Westinghouse.

A dinner clinic scheduled at Phoenix, Sept. 19, with Mort Farr as speaker, was cut out of the program when Farr's plane was delayed. However, more than 300 members of the Appliance Merchandisers Assn. heard the other principal speaker, Walter Lucking, recently appointed president of Arizona Public Service Co., and a short talk by Farr outlining a bright future for dealers. The Phoenix meeting was the kick-off for a television display at the Arizona Fairgrounds in which 19 dealers participated.

At San Francisco, where registration was 275, Clarence E. Dulfer, Dulfers West Portal, Bay district NARDA president, presided; W. J. Lee, Sherman Clay, was program chairman. In

Johnston Farr

Seattle Mike Wood, Thomas S. Wood, was general chairman and Tom Carmichael, Burns & Carmichael, program chairman; Jack Hite, NATA president, presided.

Three members of the NARDA team went on to Vancouver, where the Retail Merchants Assn., TV and appliance section, arranged a clinic for Sept. 23.

Following are brief digests of the talks:

If I Were a Dealer

Speaking on the topic, "If I Were an Appliance Dealer Today," Dan Packard pointed to two reasons for choosing that business: (1) it deals directly with making the American home a better place in which to live; (2) its future offers an opportunity probably unparalleled in the retail field.

Difficulties of the past three years are a result of having too much manufacturing capacity, too many distributors and too many dealers for the temporary size of the market, he stated. Low birth rate of the early 1930s and fact that no appliances reached the peak trading age because none were built 10 years ago resulted in a smaller total market. Those who live through the rest of this competitive period and come out with businesses organized to take advantage of the tremendous volume ahead are in for a pleasant and profitable business experience, Packard believes.

If he were starting again, he would do these things, Packard said:

1. Employ a good accounting firm to help set up a practical operating budget.

2. Select the right franchise, starting off and staying on a one-line basis; promoting aggressively the full line, not just the faster-moving items. In the shift to an industry setup more like the automobile business, those who move first will have the pick of lines and territories.

3. Make sure the store's physical setup is in tune with today's merchandising trends. Provide a visible, easy-to-enter parking area.

4. Build a sales organization big enough to do the volume set up in the budget; place the responsibility for it in the hands of a retail sales manager.

5. Lay out a carefully planned but steady advertising and promotion activity, tying in with all the manufacturer's ads, appealing to all types of buyers, giving sound reasons for bargain offers.

6. Set up to do some good old-fashioned creative selling—plan one event after another to bring people into the store; teach salesmen to canvass on the sales floor; keep up a steady

McCollum

McDavid Lee

but changing series of interesting contests to stimulate extra effort by salesmen.

7. Get out ahead of the pack—become the headquarters for the newer things; display clean, reconditioned appliances; run a real service operation; if volume permits, employ a home economist; arrange with bank or finance company to have time payments made in store, keeping contacts and getting add-on business.

Dealer and Dollar

Acknowledging that the dealer and dollar should get to know each other better, Tom McDavid went on to say that the reported percentage of failures does not reflect the true picture because it includes characters who aren't in business long enough to be considered dealers.

Insufficient capital investment is the cause of the majority of failures, he said, but there is no yardstick for determining the minimum. The appliance business was made great by the little fellow, he reminded, and each dealer requires individual consideration. He should have enough of his own money, however, to attract outside capital because intelligent use of other people's money is the key to success.

A dealer cannot neglect the financial side of his business and he cannot delegate it, McDavid declared. Here is some advice he would give:

1. Handle fewer lines.

2. Pick a distributor who will work with you and maintain proper inventory.

3. Deal with a financing institution that permits you to keep merchandise on the floor as long as six months; makes periodic physical checks on this merchandise. The dealer should pay off floor plan merchandise just as soon as it is sold; he should keep suppliers and bankers informed of progress, ask their advice.

McDavid believes that any finance plan should carry adequate insurance to pay off in case of death. Get the institution to give you every good risk, he advises.

Up and At 'em

There is no room for lead in our thinking, our advertising, our selling—or in our pants, Ed Hegarty emphasized in his luncheon talk. He made a forceful presentation that got everybody into the act.

We don't think up, he declared. "Ask how's business and they tell you something negative." Another instance of lead in thinking is saying "It's the other guy's fault." When we admit it is our fault we can do something about it. This lead isn't limited to retailers, he emphasized. "Manufacturers and distributors get it too."

We think advertising can do it all but it can't, he continued. This business was built by men who went out to get it. Most of the manufacturer's cooperative advertising dollar today is going down the drain, Hegarty thinks. Don't run an ad because you have some co-op money coming, he advised, don't run one that doesn't make you do something.

When selling, don't talk generalities, he said. The customer wants to know specifically what it will do for her.

"How long has it been since you called on a customer?" he asked. Go around and meet your neighbors, he counseled. Call on three customers. You will find out things—maybe that they aren't *your* customers at all.

Clean Selling

Let's be in the appliance business all the way, George Johnston urged. There are two basic philosophies involved, discount and sell up. Discount selling and price cutting aren't new, he declared, they always have been with us and always will be. Keys to successful appliance retailing:

1. Believe in what you do and the way you do it.

2. Carry on a consistent sales training program. Many a discount is merely a substitute for knowledge. Salesmen must know as much as a college professor and should be paid as much. (At Johnstons training is in charge of a senior salesman; assignments are given and written reports required; the salesman who gives a bad pitch loses his turn at that product until he can give a good one.) If you are not making a profit, check your sales training program. Is it consistent, regular and is it working; is someone in charge day by day?

3. Thank God for used appliances and know how to handle this end of the business. Money can be made in it. People expect fair prices for turn-ins and the dealer must get as much for them as he can. He should lay off the basket cases but for the others he must be a remanufacturer. The refinished appliance should look and smell new and don't be afraid to use color, he advised. Don't get sore if you think some customer is going to take you once in a while on guaranty. You'll get more publicity than it ever costs you.

4. Maintain your own service shop. Any dealer who farms out service is not being fair to his customer. Train salesmen to sell the service shop and sell it well. When the warranty time is up, you will get paid service business.

5. Keep the customer's decision small; make her problem your problem. Our customers are not really as hard boiled and price conscious as they seem, he pointed out. Often they act that way to cover their insecurity. They are afraid to make big decisions and deep down in their hearts they aren't so sure they know a bargain when they see one. Point out that your price is the lowest that can be offered with safety. Encourage the customer to buy from you, send it back within 48 hours if not satisfied.

"Do these things and you will be making more money than you can comfortably spend."

What Makes Success

Although the delayed flight that curtailed his Phoenix visit put him into San Francisco behind schedule, Mort Farr arrived in time to give an inspiring report of the recent NARDA management institute at the School of Business Administration, American University, in Washington, D. C.

Limited to 50 appliance-TV dealers, the institute was a hard-working, week-long refresher course. School started at 9 a.m. and most of the men kept at it until midnight, Farr said.

He repeated some of the information given by Dean Nathan Bailey of the university and others, covering

topics from trade-ins to getting along with people.

No industry was ever so kind to so many people and so cruel to itself, he pointed out at the beginning of his talk. What makes a successful dealer, profits or ethics, he asked. "If we are going to judge by profits, maybe some of the people we don't approve of are the most successful."

Enthusiasm in Selling

Sales are seldom lost to a better product; they are lost to a better salesman, J. P. (Kip) Anger, Motorola assistant national sales manager, Chicago, said at the San Francisco meeting.

There is a tremendous shift in our standard of living based on fulfillment of wants, he said. Now the burden rests squarely on marketing.

The public is a little skeptical of the retail salesman, Anger pointed out. Initiative can be yours, however, if you make people discontent with what they have. The refrigerator came into its own during the depression era, he reminded, because salesmen seized the initiative from customers. Obsolescence is the key word today, he said.

Anger's advice is: "Don't confuse customers with five or six lines, never have more than two sets on at the same time and be sure there is a big difference. Find out what customers want and sell them right away."

Sell creatively and put enthusiasm in your selling, he urged. The customer won't forget you if you do; she won't be content with a less enthusiastic pitch down the street. "It is in your hands."

Creating Climate

Jim McCollum, manager, advertising and publicity, Pacific Gas and Electric Co., told what the utility is doing to help create the sales climate. Object of the company advertising campaign, he said, is to move appliances "out of your stores on to our lines." Each ad carries the line, "See Your Dealer," along with the company signature.

The company does not sit in an ivory tower and play by ear, McCollum stated. In planning its promotion, it takes advantage of experience and readership surveys. It has a council of salespeople and of dealers; receives reports from all over the country through the utility advertising exchange service; gets a third-party viewpoint by use of an advertising agency, draws on the agency's broad research facilities.

Advertising is planned month by month a year in advance to tie in with the seasons. Two months before a particular ad is to appear, the utility asks what appeals dealers are finding most effective; the words that switch the sale.

The present group of PG and E ads features real people with real appliances. Ease of ownership, not a particular make, is sold. The ads are shown to dealers in time to plan tie-in promotion. Those who are not taking advantage of the opportunity are missing a good bet, he thinks.

In Seattle NATA sponsored the Profit Clinic; drew a good crowd for luncheon and sessions

From the Distributor

Speaking for the distributor, Al H. Meyer, president of the Leo J. Meyberg Co. of San Francisco, declared that there is no substitute for courage and determination coupled with merchandising skill.

Noting the difference in setup of the automobile and appliance industries, he pointed out that the fact that the electrical dealer is not tied up to his manufacturer but can shift or add lines at will gives him a lesser say in fixing policies.

Production is determined in advance on the basis of the appliance manufacturer's best market estimate and the distributor must sell a fixed proportion of the appliances that are built. To meet his obligation he sometimes finds himself forced to seek other outlets than those he would choose.

The big market ahead means that all must lift their sights and sell and that the dealer must do his share of the increased business in a legitimate way if undesirable outlets are not to get a foothold.

The industry cannot allow salesmanship to be the last resort of the untrained man, Meyer declared. If the retailer has training, skill, courage and resourcefulness he need not fear competition.

Operation Snowflake

Substituting at San Francisco for Robert Rhodes, *Saturday Evening Post,* Jim Dickerson, Curtis Publishing Co., told of the plans for U. S. Steel's Operation Snowflake—1955. He urged dealers to use the symbol and slogan. Retailers, distributors, utilities, banks are tying in with the big promotion program, get your share, he advised. A promotional kit is offered at no charge, telling how to do this.

Changing Markets

Ted Hahn, appliance merchandising manager, *Life* Magazine, showed a film at the San Francisco session on changing markets. Rise of the middle-income group as the important factor in buying presents an opportunity to the electrical industry. This group now purchases 83% of the luxury goods.

Larger families, fewer servants, more older people living by themselves and increased buying power add up to more appliances sold, it is shown.

Prediction is that 1960 will see the biggest boom in American history, with tremendous opportunity for sale of new appliances, color TV and complete kitchens. First, however, the problem of adequate wiring must be solved, it was brought out.

Service Management

The Seattle meeting included an evening session and an afternoon service management clinic that ran parallel to the profit clinic. In addition to the NARDA group, speakers were Paul Raver, Seattle City Light; Paul Wendel, editor and publisher, *Service Management* Magazine; Wils Gaw, Seattle Gas Co.; Russell Young, Seattle *Times.*

ELECTRICAL WEST Sales Guide

News Letter

October 1955

FOR THE ELECTRICAL MERCHANT OF THE WEST

A really different show, with lots of color and a contemporary look, the Exposition of Modern Living at Oakland opened Oct. 1 as this issue went to press. Attendance was expected to build up during the week to a large Saturday and Sunday crowd, Oct. 8 and 9. Zigzag arrangement of display spaces was unusual and enabled people attending to see all exhibits to better advantage. The show will be reported in detail next month.

Different

San Diego's Electrical and Home Appliance show (which drew 175,000 last year) will open traditionally the day after Thanksgiving, will run through Nov. 30. While Christmas Tree Lane will be lighted on opening night, according to custom, and the a capella Christmas choir will be presented, Bureau of Home Appliances intends to concentrate as usual on exhibits to draw crowds to its admission-free show.

Exhibits will draw

Tucson Appliance Merchandisers Assn. has already scheduled the date for its Second Annual TAMA Appliance Festival: April 19-22 at the Pima County Fair Grounds.

In the spring

Washington Water Power won in the nonmerchandising class in G-E's contest for effective promotion of major appliances by electric utilities. The award named Kimball I. Jack, general sales manager, and Gordon DeFoe, general sales supervisor; cited the company for a very large increase in appliance sales on top of a very high average use and appliance saturation, for an active promotional program using many innovations as well as recognized methods. Even before WWP began its present intensive campaign, involving direct aid to dealers, in early 1954, 85% of its residential customers had electric ranges and water heaters. In the past seven months, however, northern Idaho and eastern Washington dealers report sales of 6,137 ranges and 4,103 water heaters. Appliance sales for the period totaled not less than $2,200,000. A major factor in the award probably was WWP's successful campaign for 200-amp home service entrances. Idaho Power received honorable mention for its entry.

WWP is first

A program to spark a united-front promotion of electric appliances is being proposed to power companies by General Electric (see p 95). A backdrop of manpower and promotional tools to support local efforts would be provided. There would be no G-E identification on basic promotional material for this "Live Better Electrically" campaign. Other manufacturers would be urged to join in on the program and to furnish materials for it.

Live Better

From all reports Radio-TV Week was a huge success in the West. At Los Angeles, where the broadcasting and telecasting industry donated more than $100,000 worth of radio and TV spots and Queen Marilyn presided, the week was highlighted by a Civic-Industry luncheon at the new Beverly Hilton; offered a consumer contest with more than 60 sets as prizes. . . Central Arizona dealers tried for $1,500,000 in sales during a five-day TV and radio festival at the Arizona Fairgrounds. Sponsored by the AMA, the show was opened by an industry dinner; had the Atomic Exhibit as an extra drawing card. . . At San Francisco it was estimated that $20,000 was spent on special cooperative advertising and about $50,000 was donated by media. . . In San Diego the week was only the kick-off to a six-week campaign, with newspaper, radio, TV, car card and poster promotion built around the "second set" theme. On-the-spot cash awards are being given salesmen who show they are reading and using the advertising. Professional shoppers chose dealer stores at random; if the salesman's opening remark contains some of the copy in teaser, cartoon-type ads, he wins the money.

A big promotion

Southern California Edison sponsored a half-hour TV preview of some of the all-electric kitchens open for inspection at the Los Angeles County Fair. The kitchens were designed around built-in appliances now available; were manned by trained home economists who described the equipment. Another feature of the TV display was a heat pump demonstration.

Kitchen preview

Washington Water Power Co. has come up with a new idea on electric space heating that could solve utility headaches. It plans to promote a heater to be installed in the forced-air system of central furnaces that will supply up to one-third of yearly heat requirements. The 3- to 5-kw unit will operate only when outside temperature is above 40°. Below that a dual control will cut out the heater and start up the furnace. Details in an article soon.

New idea

Want to add A.A. to your name? San Diego Bureau of Home Appliances is offering an Associate in Arts Degree in Sales Management, Appliance Industry--a first in the West and probably in the nation. Developed by the bureau and San Diego Junior College and Vocational School, the degree is awarded on completion of a planned training program. Some of the courses are given by the bureau, others by the college.

A.A. degree offered

The Portland city ordinance designed to curb rackets in telephone solicitation was repealed just before it was due to go into effect. Repeal was asked by Commissioner of Finance O. R. Bean to prevent restriction of legitimate business solicitation by phone.

Can use phone

Stanley A. Weigel, California attorney who has made a study of fair trade and unfair competition practices, told members of the San Francisco Pot & Kettle Club: "I think the cost of policing fair trade contracts should be borne by the manufacturer. If he feels he cannot do so, as I am told Westinghouse announced recently, then the thing for him to do is drop fair trade. Fair trade without policing is not fair trade."

Fair trade talk

G-E last month appealed to the Oregon Supreme Court from an April 1955 Multnomah County Circuit Court decision holding state Fair Trading legislation unconstitutional. In refusing a G-E injunction request, the court had declared the legislation unlawfully delegates power to fix prices and fails to provide any standards of guidance for such fixing. The manufacturer had filed suit against a Portland firm, R. H. Wahle Co. The court pointed out that the G-E agreement had been with Sprouse-Reitz Co. and not binding upon Wahle.

Appeals decision

Despite an array of live talent, electric clocks were the real stars of the show when G-E Telechron brought its caravan, "Rise and Shine," to the Fairmont Hotel in San Francisco, Sept. 7. Planned to present the 1955 line at the start of the peak season for clock sales, the caravan also visited Los Angeles, Seattle and Denver. Not for sale yet but on display and conversation piece of the evening was the cordless clock in a handsome case. At the dinner meeting for salespeople, variety acts were interspersed with sales training films and talks. Also announced was a 12-day Caribbean cruise for winners of a sales contest to run Oct. 1-Dec. 15. Traveling with the show from the Clock and Timer Department were: A. F. Fisher, general manager; R. T. Woodward, marketing manager; D. E. Perry, clock sales manager; E. C. Pease, advertising and sales promotion manager.

Stars of show

One way to send customers straight home was told by George Johnston at the NARDA Dealer Profit Clinics held in the West (p 78). Plagued by a customer tendency to buy, then shop around before going home and cancel, Johnston resolved the problem this way: As soon as the salesman has written up the order, he invites the customer to take part in the ice cream sampling campaign, steps to the freezer, takes out a quart and tucks it under her arm. Another Johnston idea: A punch board to stimulate salesman effort. For every small appliance sold the salesman gets a chance on the board, can win from 10¢ to $25 on a 100-punch board; average is about 80¢.

Keeping 'em sold

Order for 848 electric kitchens was signed by B. C. Deane, president of Hartford Builders, for tract homes near Los Angeles. The contract with Hotpoint calls for built-in type appliances in color. Southern California Edison will serve 648 of the homes in the Pomona area. Two hundred in the San Fernando Valley will be served by the Department of Water & Power. Model homes will be open for inspection about Nov. 1.

Largest yet

PG and E is plugging electric heating with newspaper advertising, bill stuffers, posters and office displays. A direct mail piece carries the theme, "Be modern...heat electrically"; offers a guide book on electric space heating, with a business reply card to make it easy to order. In November the utility will go all out on dryers and in December will tie in with Operation Snow Flake.

Plugs electric heat

Los Angeles Department of Water & Power in cooperation with the Electric League will start its dryer campaign Nov. 1. It will be patterned after last year's drive, which more than doubled the volume of dryer sales as compared with the previous year.

Will push dryers

B. C. Electric has a home service center on the main floor and a test kitchen on the second floor of its new building at 820 Pandora Ave. in Victoria. Dealer services will be located on the third floor.

New quarters

Dealer's Choice is the order for a 60-day "sellebration" in El Paso Electric territory. It will promote ranges and dryers through Nov. 23. The utility will pay appliance dealers $20 for old electric ranges and $10 for old "other than electric" ranges; will continue its regular range wiring allowance during the drive. Dealers may offer each purchaser of a 240-v electric clothes dryer $30 toward the installation cost, one-half to be paid by the utility, the balance by the dealer.

Play cards

Gibson will show its 1956 line at a national sales conference to be held Oct. 15 and 16 at the Last Frontier in Las Vegas, J. J. Lukanish, San Francisco distributor, reports. All distributors and more than half of the distributor salesmen are expected to attend.

1956 line at Las Vegas

Typhoid Marys

Typhoid Marys (model all-electric homes) present one of the finest opportunities for publicly demonstrating how the "Live Better Electrically" concept can be put into practice by every present and potential home owner, G-E's Roy W. Johnson said at the RMEL convention. "As these Typhoid Marys go into individual communities they cause dissatisfaction with the old home, the nonelectric home, very very rapidly. We see it in the communities in which we work, speeding up the process of modernization of homes by five or ten years."

Wins home

Mrs. Robert B. Todd of Oakland, Calif., won the Western Hotpoint Living-conditioned Home contest, part of that manufacturer's $2,000,000 activity in which four all-electric homes, 50 all-electric kitchen-laundries and thousands of appliances were given away.

New models

A new Packard water conditioner uses a nuclear physics principle to treat hard water scale and corrosion; is claimed to prevent scale and to dissolve existing scale in boilers, air conditioners, industrial washing equipment; is for industrial, commercial and domestic use. J. J. Lukanish will distribute it in the Bay area. . . New Laundromat and Dryer twins were introduced by Westinghouse in white, aqua or yellow; feature illuminated control dials, built-in washing and drying instructions for all fabrics. . . Frigidaire will make entire kitchens as integrated units in several series of models to fit different price classes and in a choice of color schemes. They will be modular in construction, with their own interior walls, lighting, plumbing and exhaust facilities, ready for builders to set them in as structural components. . . A new design in electric blankets that uses 140 instead of 180 w for heating has been announced by Philco in twin and regular sizes and five pastel colors.

New designs

A 22-in. all-glass rectangular color TV tube was announced by Westinghouse. Unlike tubes using metal in the envelope, the new tube requires only the standard insulation of a black-and-white set, it was pointed out. Mass production of the new tube is promised for 1956. . . G-E has developed a micro-miniature tube design for UHF television tuners and converters.

Do they agree?

Believing that everybody (including the customers) would benefit, Southern California Edison Co. brought servicemen into the home economists training meeting for a panel discussion. Subject: Are servicemen and home economists telling the same story to our customers? There will be more on this later.

Moved

Electric Corp., wholesale distributor of electrical supplies and appliances, has moved its Stockton branch from West Washington St. to a new place at Aurora and Market St., according to "Duke" Imholt, manager. The new place has 14,000 sq ft of office and warehouse area and a 50x100-ft parking lot. John Zedarsky is manager at Stockton.

About people and products

O. R. Coblentz, San Francisco, L. Chism, Denver, J. L. Walker, Seattle, were among Westinghouse regional sales and district managers who met with top sales and service executives at the company's TV-Radio factory in Metuchen, N. J., last month. . . J. D. Crawford, former general manager for Crosley Distributing Co. in the Pacific Northwest and for the Oregon RCA distributor, has founded a new organization, Jack Crawford Co., 1001 S. E. Water St., Portland. He will distribute major appliances in Oregon and southwest Washington, including Bendix TV and the Granco radio line. . . Dormeyer's new line of portable power tools will be distributed by W. P. Fuller Co.; will range from a $21.95 drill to a $89.95 circular saw kit.

Gawne Morr Forte Gaffney Atkins Paxton Tubbs Volheye Kirsop

Inspectors Talk NECode Changes

Despite distance apart remarkable unanimity of thinking characterized the two annual meetings of International Association of Electrical Inspectors, the Northwestern Section at Bellingham, Wash., Sept. 12-14; the Southwestern Section at Mission Inn, Riverside, Calf., Sept. 19-21. There were other similarities too: officers of both groups suffered calamities. IAEI President Col. S. R. Todd of Chicago was hospitalized for an emergency operation in Seattle and was unable to attend either meeting. Secretary-treasurer W. L. Gaffney, NW Section, had an automobile accident en route to Bellingham, hospitalizing Mrs. Gaffney. President Ben Wheater of the SW Section had his car burglarized.

First Vice-president H. G. Ufer, retired, substituted for Colonel Todd at both meetings. In addition, at the Riverside meeting he gave a historical review of the events leading to the formation of the California Electrical Inspectors Assn. and the formation of IAEI.

In the separate reports below of the two conventions similarities will be noted and, to conserve space, outlined but once and cross referenced. Wherein they differed will likewise be separately noted.

Northwestern Section

- **200-amp services**
- **Unlimited subdivisions of load**

Vice-president Cliff Atkins, an Oregon State electrical inspector, presided, following appointment by the executive committee to fill out the unexpired term of J. C. Hewitt. Hewitt resigned as an active member when he gave up his job as chief electrical inspector for the State of Washington to accept another position in the industry.

Ufer and Smith

In the absence of Col. S. R. Todd, international president, who was hospitalized in Seattle, H. G. Ufer, first vice-president, extemporized on the possibilities of the association as a common meeting ground for all segments of the industry. He said that much more can be done to publicize the association's work and that it would be particularly desirable to bring in such men as layout engineers and architects who could well afford to avail themselves of the educational values offered. He made a plea for a more careful study of fire causes to eliminate from fire reports those alleged to be of electrical origin. Ufer made the same address to the Southwestern Section.

In a brief address, President Atkins emphasized the advantages of membership in an association that brings all branches of the industry together and permits open discussion and expression of opinion on code matters. He urged each member to secure one new member and mark the application "This one for Cliff."

J. A. MacNabb of Underwriters' Laboratories Inc. presented a tentative plan to divide the equipment list,

President Wheater, Secretary La Fehr, Utility Commissioner Freeman

which is becoming too bulky, into two volumes. One volume would cover materials in the service entrance, including switches and overcurrent protection, while the other would cover all materials on the load side of service equipment. This proposal received general approval of both sections.

The 200-Amp Service

H. V. Wright of the Washington Water Power Co. told the story of the development of Spokane's 200-amp service entrance requirements, illustrated with colored slides. This local code requirement was the result of a cooperative effort by the inspector, contractors, utility and distributors to avoid in the future the problems which exist today as a result of limited service entrance capacity. The installation, which is required in residences of more than 500 sq ft floor area, consists of a 1½-in. service entrance conduit and 200-amp meter socket.

It was felt that these provisions would greatly simplify the problems and reduce the cost of subsequent additions to care for the load of anticipated known and presently unknown residential uses. The installation is called an "expandable service" and has since been adopted by several towns and is a matter of great interest to others. Typical installations were shown and methods of later utilizing the available entrance capacity. In general, the procedure is to terminate the 1½-in. conduit in a gutter from which additional equipment can be supplied. One of the advantages of the specific entrance requirement, as far as the contractor is concerned, is to put bidding, at least entrancewise, on a par basis.

Wright's presentation was followed by a discussion of the same subject by J. A. Paxton, chief electrical inspector for the city of Spokane. He related that the program had first been considered four or five years ago, prior to the advent of clothes dryer or space heating load of any consequence. He indicated that it had been impossible to accomplish much by education, so he had resorted to modification of the local ordinance. Paxton stated that the usual service installation is made with No. 1 RH wire, which will care for a computed load of 130 amp. This can be expanded to 3/0 with reduced neutral size. Most of the houses in Spokane have basements with surface-mounted service equipment and questions as to methods of expanding recessed service entrance equipment or expansion where the six disconnects allowed were already in use went substantially unanswered.

The method of reporting electrical fires was the subject of considerable discussion, particularly in view of the large percentage classified as to unknown origin and the fact that it is not made clear whether fires are the result of material failure, faulty installation or misuse. When it was realized that these problems could only be met by pin pointing specific materials, the consensus favored continuing the present method of reporting.

C. L. Smith, IAEI secretary-treasurer, discussed the printed proposals for amending the 1953 edition of the NEC. The section went on record as opposing the adoption of the Thornton numbering system but recommended an improved index. (SW Section took similar action.) Relative to proposed new Sec. 2466, dealing with high-capacity fuses, the section recommended the deletion of part (b) referring to noninterchangeability as being impractical and suggested it be referred back to the panel and Fuse Guild. (SW Section also.)

Consideration of the report of the special committee on plug fuses resulted in a resolution recommending that the fine-print note following Sec. 2452 be removed, this in accordance with the traditional stand of the inspectors. Attention was called to the need for correlation between the NEC and NESC in some instances which will be followed up by Smith.

A panel consisting of C. L. Smith, Merwin Brandon, Joe Gray and J. H. Watt was appointed to moderate code discussion. The opinion was expressed that polyethylene insulated triplex cable service drop could not be permitted within eight feet of the ground since the code requires rubber or equivalent insulation. Polyethylene must be treated as WP wire until approved by UL as a rubber substitute. Eight years of continuous service for this type of cable without failure was cited.

J. H. Watt reported that 20 interested members had met in evening session to discuss a change in the present six-disconnect provision of Sec. 2351(a). The confusion resulting from the many methods employed to meet this requirement and the problems created by load growth under this limitation were the subjects of extended discussion. It was noted that Spokane had provided for an expansible service and that a parallel need existed with respect to the disconnecting means. A motion was passed recommending the elimination of limitations on the number of disconnects in all residential occupancies. The extension of this provision to smaller commercial occupancies was discussed but no action taken. Contrary to this thinking Lance Robson, chief electrical inspector for the Province of British Columbia, reported that all the Canadian provinces have been asking for a main disconnect. (SW Section voted down this NW recommendation. Many ordinances now require a main disconnect.)

A situation new in the area was reported by T. M. Widrig and W. L. Gaffney. A Tacoma hospital following civilian defense recommendations has decided to install, in addition to the normal emergency supply for operating rooms, incubators and the like, supplemental generation capable of

maintaining essential services such as minimum lighting, cooking, etc., with the interruption of the main supply. Power required would represent about 35% of normal. This installation will be equipped with a manual throwover. Since this is a new development, the opinion was expressed that there should be some code coverage of the matter.

The following officers were elected, following the recommendations of the nominating committee: president, Cliff Atkins, state electrical inspector, Portland; vice-presidents, H. S. Moor, manager, Rating Bureau, Salt Lake City, and P. H. Forte, city inspector, Boise; secretary-treasurer, W. L. Gaffney, chief electrical inspector, Tacoma. The executive committee consists of J. H. Paxton, J. D. Gawne, E. M. Tubbs, J. Hyde Stayner and T. M. Widrig. On the executive council of IAEI are E. B. Morrison, Oregon Rating Bureau, Portland, and C. M. Kirsop, chief electrical inspector, Olympia, with W. R. Volheye, chief electrical inspector, Oregon, as alternate.

Registration at the meeting was 116 plus 45 ladies. A local committee, consisting of E. M. Tubbs, chief electrical inspector, chairman, D. D. Dunhaver, city electrician, and J. J. O'Rourke, manager at the Bellingham Hotel, was largely responsible for the success of the meeting.

Gerber Price Hanson Hefner

Southwestern Section

- **Reinspection before resale**
- **Inspector training courses**
- **100-amp services**

Code change discussion was scanty at the Southwestern Section, presided over by Ben Wheater, Long Beach chief electrical inspector, section president. The printed copies of the proposed changes only reached members at the convention, and only 50 copies were available. By common consent there was no discussion of these pending more time to study them. The section did not concur in the NW Section recommendation relative to removing the limit on subdivisions of load from residential services but it concurred with the NW on opposition to a new numbering system and in referring the controversy over high interrupting capacity fuses back to the panel and to NEMA and the Fuse Guild for a better solution.

What did concern this group, and occupied most of a code breakfast, was the problems of grounding engendered by plastic water pipe systems. (To clarify the now confused thinking about grounding in all of its phases a series of articles will soon be run in this magazine.)

Luminous diffusing systems (ceilings) came in for a different type of jurisdictional questioning. Should they be under the electrical or the building department? What New York City and others have done to define these as fixtures was told. Harold Gerber, consulting engineer, said engineers could not be responsible for calculated lighting results if the work was separated. "It's like putting a clean collar over a dirty neck," he said. The fire resistivity question and Underwriters' Laboratories ratings of plastics for ceiling use also came up for comment.

Trouble with excessive heat built up in recessed fixtures and a demand for more air space in the UL specifications occupied the second code breakfast. Ceiling-type heaters and increased wattage in lamp envelopes were reported giving socket and wire trouble from transmitted heat.

More heat, however, flared up in an argument over the rewriting of the code between the perennial debaters, Harold Gerber, former inspector now consulting engineer, and Merwin Brandon, chairman of the code making electrical committee of NFPA. Gerber maintained that as long as a rewriting of the code is being done there should be eliminated much of the wordage concerning things now obsolete or to which inspectors pay no attention—namely the ambient temperature ratings of wire. Brandon, as code committee chairman, held that if Gerber had any changes to propose he knew the procedure and should submit them through proper code panels. Traveling thus in two parallel lines there could be no meeting, unless it be at infinity. But the fireworks did awaken a drowsy afternoon technical session.

What really was different about the SW Section meeting was its attention to education for inspectors to help them do their jobs better, a public relations idea for home reinspection before resale of the property and two approaches to adequate wiring—the utility man's and the inspector's.

At last year's convention at Elko an experiment was made. E. E. Carlton, then president, brought the result of that test to the Riverside meeting. It showed that the conference method could be used successfully to exchange knowledge and experience in education of inspectors. Carlton told of such conference courses now set up at University of California for training of building inspectors and urged the association to ask for similar courses in which electrical inspectors can train themselves and new men in administration, public relations, inspection methods and even interpretation of the codes.

A public relations approach to a difficult problem was offered by John Thompson, Berkeley electrical inspector. It is a plan for voluntary re-examination of existing homes about to be sold, in a manner similar to termite inspection. (See full details, p 91.) This plan was endorsed by the section as it had been by the Northern California Chapter.

Utility company attitude toward adequacy and safety has changed, declared Les Waggoner, Arizona Public Service Co., and secretary of the Ari-

Veit, Heffner, Clark, Nelson, Smith, Ufer, Winterer, Jones, Cyr, Dobson, Ambrosi, Alverson, La Fehr, Johnson

zona Chapter, at a luncheon address on "Safety in Adequate Wiring." Reviewing the history of wiring promotion alongside the growth in appliance use, he urged inspectors to anticipate what the productive capacity of appliance manufacturers and utility generating capacity would impose on home wiring. He urged the inspectors to aid the industry to provide for the future in the standards they establish.

An inspector's view of what can and cannot be done for adequate wiring was presented later that day in a thoughtful paper by Chester Hefner, San Mateo County, which we hope to publish later. "The big problem, in my opinion," he said, "is the very obvious fact that what is adequate for one is inadequate or even exorbitant for another." He urged utilities to conduct more load and demand studies on residential lines to provide data for re-evaluating the demand tables in the code. He also felt that a service raceway sufficiently large to allow future increase in copper size could be justified.

Another excellent feature of the program was a pictorial and audience-participation session presented by E. E. Carlton, supervising electrical engineer, California Division of Industrial Safety, and Ira J. Allen of the same. Color pictures of electrical installations taken by the engineers of the department on their inspection tours were shown on the screen and the audience asked to find what was wrong with them. This proved a stimulating game and led to informative discussion. It also served to show actual, rather than code theoretical, situations.

Electrical fires, reported on by Harry Dobson of Santa Barbara, chairman of the section committee, came from 15 cities (an increase in number reporting) and listed 2,360 cases. Motor burn outs accounted for 42%, cord fires 16%, wiring and devices 15%, TV sets 6%. His charts showed a trend of increased motor failures, a decline in cord and wiring fires.

Industrial accidents, reported on by Robert Haynes, Division of Industrial Safety, showed a decrease in fatalities in 1954 although an increase in the percentage of them caused by contacting high-voltage overhead lines. Portable tool injuries came next in the classification of accidents.

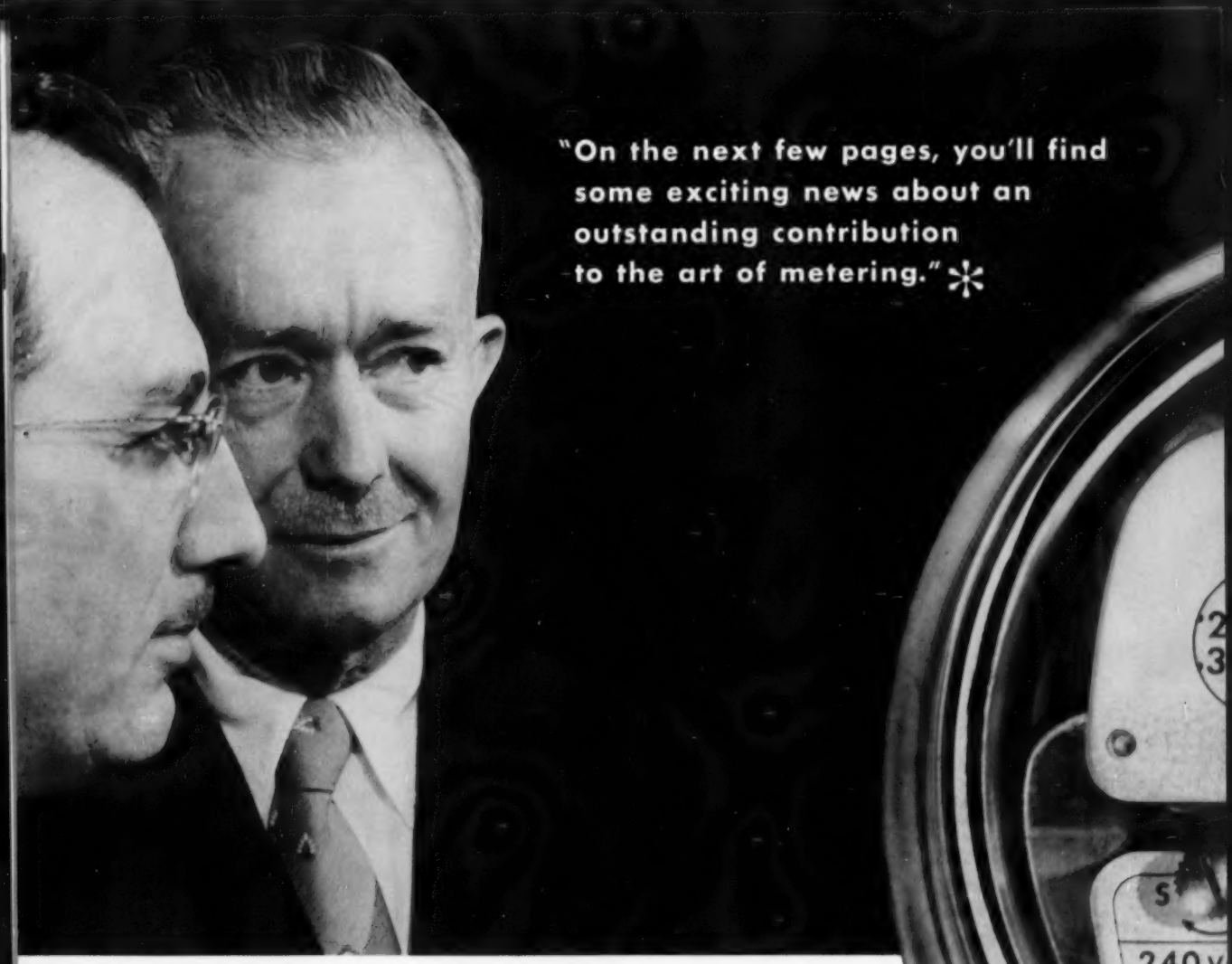
E. F. Cogan, technical assistant secretary, IAEI, Chicago, conducted a session to consider whether the reporting method on electrical fires could be improved. He also told how members could assist the staff in keeping names and addresses straight and discussed some of the headquarters' programs of publicity and the *News-Bulletin*. Charles Smith also discussed IAEI affairs and told why the executive council had postponed the formation of a Hawaiian Section until financially feasible.

At the election of officers James L. Ambrosi, an Oakland electrical inspector, was elevated from first vice-president to president; F. C. Jones, Arizona Fire Rating Bureau, first vice-president; Barney Alverson, San Bernardino County inspector, second vice-president; Chester Hefner, Redwood City, third vice-president; and L. E. La Fehr, Alhambra city inspector, re-elected secretary-treasurer. The executive committeemen elected were Cecil Clark for Arizona, Clyde Smith for Central California, E. Warren Small for Hawaii, M. E. Lundberg for Nevada, E. L. Nelson for Northern California, C. E. Jarvis for Sacramento Valley, Harry Dobson for Southern California Chapters; H. K. Winterer, W. A. Cyr and L. W. Johnson, associates. For members of the executive council, H. G. Ufer and A. C. Veit were re-elected. Next year, it was voted, the meeting will be held at Hoberg's resort in Lake County, Calif.

Waggoner and Cogan

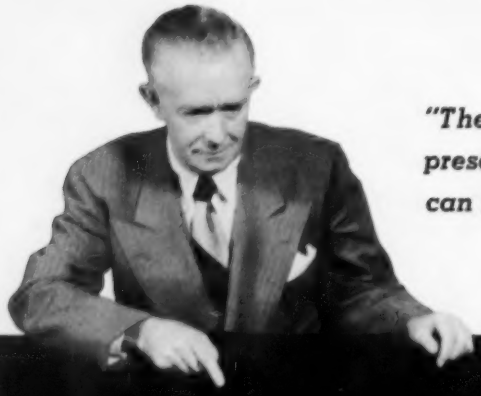
Because he will retire in January, Harry Dobson was voted an honorary member for his long and faithful service to the organization. And Barney Alverson was commended highly for the general management of the entire convention, at which registration totaled 172 men, 58 women. The manufacturers' display was under Paul Mullenbach. NECA and IBEW were hosts to a cocktail buffet before the banquet.

Committeemen under Alverson responsible for the convention success were: Jim Bethel, registration; Paul Mullenbach and Tom Regas, displays and ads; Cecil Parker and Harold Williams, publicity; Ray Lindelef, hotel; Don Harrowood and Clyde Soden, entertainment; Sam Marrocco, reception; R. Stevens, photograph; Jesse Ross, liaison; W. B. Walton, NECA, and Jack Carney, IBEW, hosts.



The new Westinghouse *Lifetime* meter...

*Dick Blevins, right, Westinghouse Meter Division Sales Manager, discusses the new meter with Carroll Roseberry, Manager, Electric Utility Sales. On the next seven pages, Dick will discuss the new Lifetime meter with you.



"These Lifetime meters will handle all present and future single-phase loads that can be served without transformers."

Type DA—15 amperes

Type DS—15 amperes
30 amperes

The *Lifetime* meter guarantee

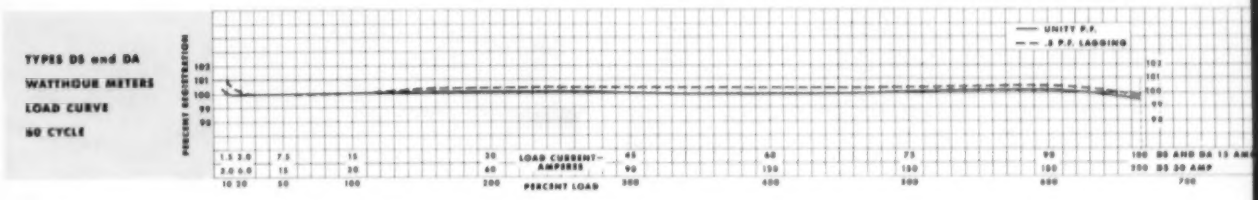
Westinghouse, in connection with Types DA and DS meters, will replace any defective part which fails under proper and normal use during the life of the meter which, for the purpose of this guarantee, is thirty (30) years from date of shipment. The replacement part will be shipped prepaid, and such shipment shall fulfill all Westinghouse obligations in respect to said meter. Westinghouse shall not be liable for consequential damages.

Why the Guarantee is Possible

There are five major factors that determine the life of a watthour meter. The superiority of the DS and DA meters on these points assures lifetime performance. These points are:

1. Range—sufficient load range to take care of present and future loads.
2. Thermal Capacity—the ability to give good service and long life at extreme temperatures and high overloads.
3. High Insulation Level—the ability to withstand high-voltage surges without damage.
4. Stability—long-time accuracy of a meter is possible only when the meter is inherently stable mechanically, electrically and magnetically.
5. Corrosion Protection—all materials and finishes must be selected and coordinated to give maximum protection against corrosion for long life, low maintenance.

The manner in which the Lifetime meter meets each of these qualifications is shown below and on the following pages.



Enough range and thermal capacity for all single-phase loads

Electric utilities are now faced with the necessity of replacing many old meter installations because they do not have the range and thermal capacity required for modern loads.

For the replacement of such meters and to provide for any single-phase metering requirements in the foreseeable future, Westinghouse has introduced the Lifetime meter—a meter with a truly amazing range. It will measure accurately all loads from less than 0.1 ampere to 200 amperes.

Lifetime meters are offered in two ratings—Type A (bottom-connected construction) and Type S (socket construction) to handle loads up to 100 amperes, and in the S-mounting to handle up to 200 amperes.

TURN THE PAGE

YOU CAN BE **SURE**...IF IT'S
Westinghouse

New insulating compounds give high insulation level

Both the current and the potential coils in the Lifetime meter have a 10,000-volt insulation level. Surge protection is provided in DS meters by De-ion® arrester gaps located in the back of the base and arranged to discharge outside the meter. In the DA meter, relief gaps are provided between the series windings and the base.

These gaps discharge at approximately 4500 volts, well under the 10,000-volt insulation of the coils. They drain off surges before any damage can be done.

The current coil is form wound to exact dimensions, using an extra-heavy conductor that insures high thermal capacity. A new polyester compound insulates the current coils and is molded to the laminations. This insulation has high dielectric strength, will not absorb moisture or give off corrosive fumes, and is free from deterioration due to time and temperature.

This method of coil manufacture results in an unusual degree of uniformity—a vital factor in meter accuracy. It also makes for long coil life and low maintenance.

Greater stability for long-time accuracy

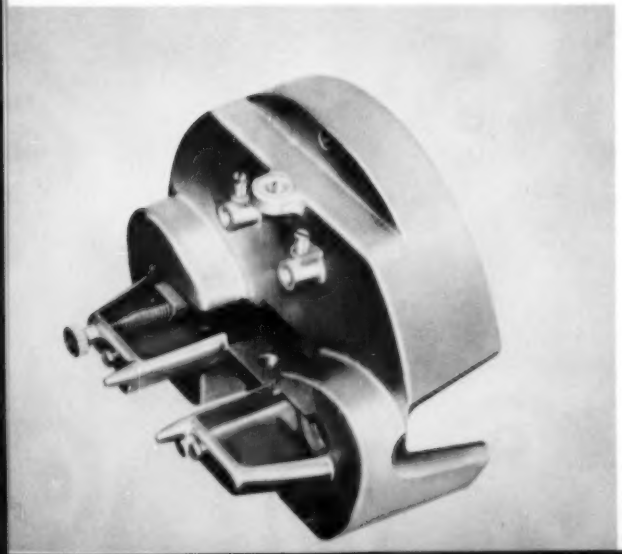
The long-time accuracy of the new Westinghouse meter is possible because the meter has mechanical, electrical and magnetic stability. These components are among those that contribute to stability:

FLEXIBLE UPPER GUIDE BEARING of hardened chrome steel fits into a non-lubricated, removable bronze bearing in the shaft.

BALL AND JEWEL BEARING, pioneered by Westinghouse in 1902, is the only time-proved lifetime bearing. It gives lowest friction and longest life. Utility records show that this bearing is practically indestructible.

DIE-CAST ALUMINUM FRAME is thicker and more rigid. The bearing and register mounts are precision-machined, eliminating adjustments in the disk and bearing assembly and in register mesh. Heavy disk guards have been made a part of the frame to prevent disk damage when the meter is laid on its face.

DAMPING MAGNETS made of Alnico are mounted in the aluminum frame, on each side of the disk. To test their resistance to demagnetization by lightning, meters were exposed to surges up to 40,000 amperes, 20 x 50 microsecond wave and showed no change in magnetic strength.



To learn about the corrosion resistance of the Lifetime meter, TURN THE PAGE

YOU CAN BE **SURE**...IF IT'S

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Corrosion-proof design to reduce maintenance costs

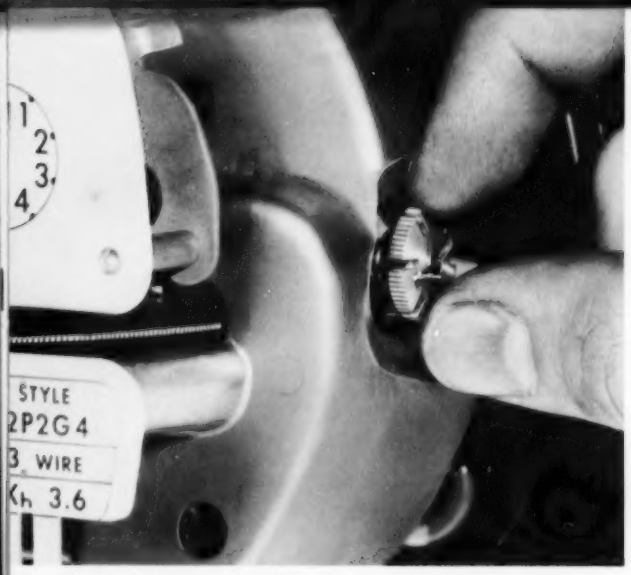
The Lifetime meter represents a close approach to a truly corrosion-proof design. Every component is built to resist corrosion.

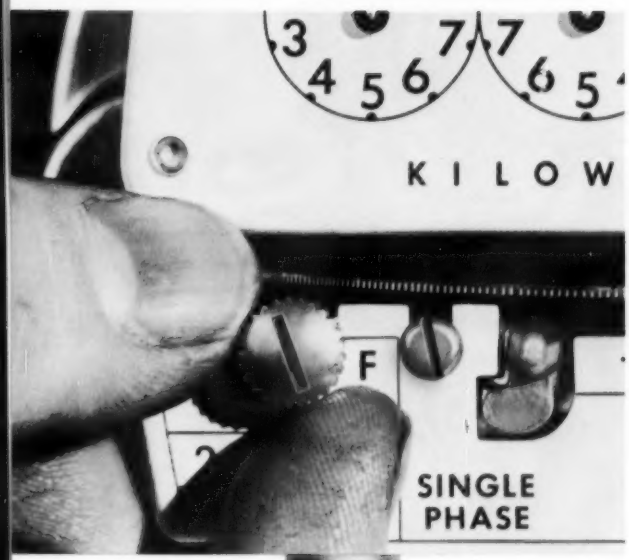
EASY TO READ REGISTER with large numbers on a permanently white dial. Gold finished gears and iridited-aluminum plates in the register resist corrosion.

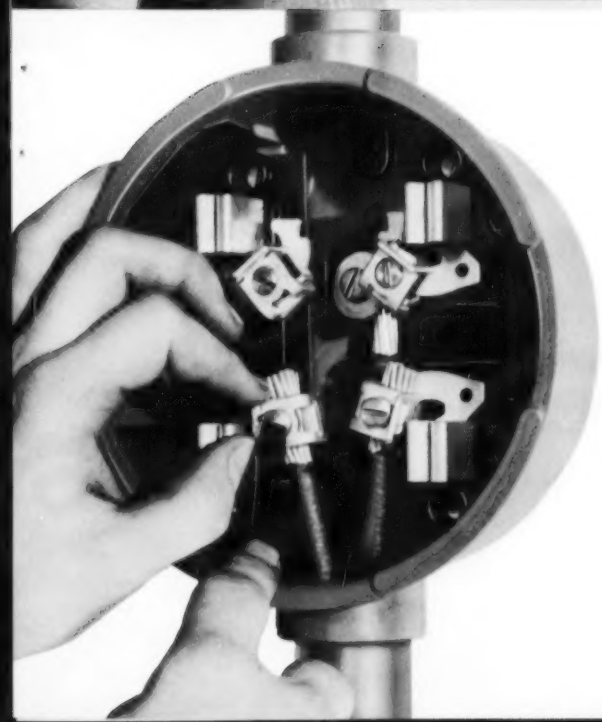
SEPARATE NAMEPLATE provides large serial numbers which are always visible. Gives you an unusually large space for tag or strip-type company identification.

BASES won't corrode. One-piece Moldarta® base for DS meter has high impact strength and extra-strong angles. Koroseal gasket will not dry out, stretch, or shrink. The DA meter has a die-cast aluminum base and the rim on the glass cover is iridited aluminum.

LAMINATIONS for the electromagnet are made of special high-grade steel that is Bonderized to insulate individual laminations, prevent corrosion and afford protection against any changes in flux pattern. The laminations are riveted together at 10 points, insuring a permanent, solid stack—a factor in long-time stable accuracy.







The *Lifetime* meter is easier to adjust

LIGHT LOAD ADJUSTER is spring loaded, can be operated by hand or screw driver from front or side. Adjustment is linear, 1% per turn, ±10% range. Adjuster is on right side of meter.

FULL LOAD ADJUSTER is also spring loaded, can be operated by hand or screw driver. It is located on left front of meter. This adjustment is linear, 1% per turn, ±10% range.

The wide range of adjustment for both light and full load adjusters assures interchangeability of electromagnets.

New high-capacity meter socket reduces installation time

The new line of Westinghouse die-cast aluminum meter sockets has more wiring space, larger and better bus-type terminals for greater ease of wiring with large conductors. Hubs have been moved to the outside to provide more space for wiring. The socket is available in three hub sizes, 1 inch, 1¼ inches and 1½ inches.

For maximum corrosion protection, the sockets are die cast of an aluminum-silicon alloy, iridited and finished with two coats of organic lacquer. A new iridited-aluminum sealing ring, which can be applied without the use of any tools, is supplied on this socket. One side of the ring has a latching projection which hooks through a slot on the other side of the ring. A ratchet arrangement then allows the ring to be drawn up tight without any tools, a time saver for installers.

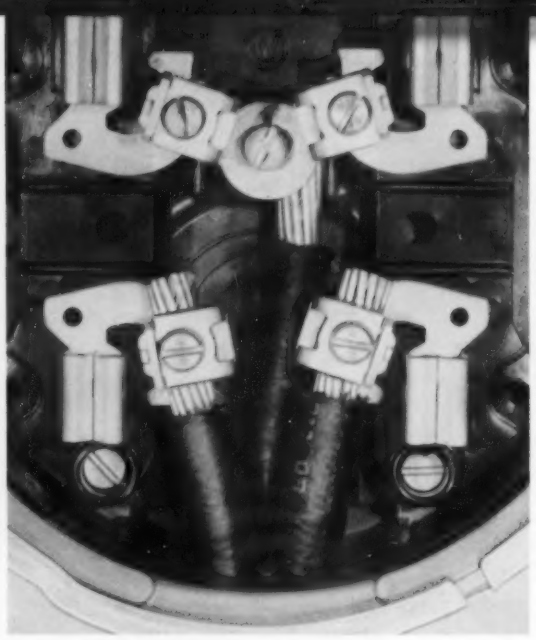
For the story of the improved terminal used in this socket, TURN THE PAGE

YOU CAN BE **SURE**...IF IT'S
Westinghouse

New high-capacity meter socket *(cont'd)*

The new socket is designed for use with aluminum or copper conductors, up to #0 gauge. The bus-type terminals have a large surface with "follow action", especially important to insure a tight connection on aluminum conductors. The terminals swivel in an arc to facilitate alignment with the conductors. Installation time is reduced when using large conductors. The installer merely takes tops off terminals, lays conductors in place, replaces tops, and tightens terminals. On smaller wire sizes, it is not necessary to take the tops off the terminals—the conductors can be easily pushed into place.

Where three-point mounting is required, an extra mounting hole can be made available by knocking out a thin breakout in the back of the socket. Sockets are available with 2 or 3 hubs and for single-phase and polyphase service.



Tops of terminals are removable so that large conductors can be put into place without bending.

and . . . a completely new plant to provide you with the latest in metering equipment

The Westinghouse Lifetime meter and the new line of meter sockets are now in production at our new 12 million dollar meter plant in Raleigh, N. C. This modern new plant has one-half million square feet of manufacturing space.

All the manufacturing facilities are modern and especially designed to provide you with the latest metering equipment. New methods of manufacturing and quality control are in use to give you the finest metering products.

* * * *

See your Westinghouse Representative for more information on the new Lifetime meter and the new line of sockets, or write to Westinghouse Electric Corporation, 3 Gateway Center, Box 868, Pittsburgh 30, Pa.

CP-1018

YOU CAN BE SURE...IF IT'S

Westinghouse

Branch Gros

Breslin Hyer

Haagensen Keezer

RMEL Members Told to Slug It Out

The public-private power issue, the political and economic outlook and residential load building dominated discussions at the meeting of the Rocky Mountain Electrical League held at the new Jackson Lake Lodge at Jackson Hole, Wyo., Sept. 11-14.

In welcoming the group to Wyoming, Governor Milward L. Simpson said: "Let's get out of the sleazy habit of forgetting the things that made us great and get out of this habit of asking for some subsidy for something or other." He granted that we need federal assistance on flood control and other matters of wide federal concern. He asked for a very minimum of federal subsidy for his state and a rededication to the things that made America great.

Harllee Branch Jr., president, Georgia Power Co. and Edison Electric Institute, followed the governor with a free-swinging attack on public power and made specific proposals for fighting the issues. "If congressional investigators are really looking for a 'give-away' of governmental favors, they will find it in the prerogatives and power which have been granted to this minority group," he said.

A Program to Restore Equality

Branch said: "The first step in curing this dangerously unwholesome situation seems clear. The statutes and regulations granting special privilege must be amended so as to restore fair play among all our citizens and to assure that no state or region will be favored at the expense of another. Here are three amendments that will be necessary at the very start: (1) Governmentally owned and subsidized power groups should be required by law to pay federal, state and local taxes (or the full equivalent thereof) the same as the investor-owned utilities and their customers; (2) governmentally owned and subsidized power groups should be required to charge rates and repay to the government sums that are adequate to cover the true cost of power including, in addition to full taxes and tax equivalents, the government's actual cost of money on the entire investment properly chargeable against the power business, and including an amortization rate that will actually return the money taken from the taxpayers who have become the involuntary contributors of capital for government-financed power projects; (3) by-product electricity generated at government projects, whether from water power or steam and whether using atomic energy or other sources of energy, should be sold at its fair market value at the point of generation and, to avoid discrimination between citizens, it should be alloted to applicants in proportion to the number of rural, residential and commercial customers to be served. The government should not assume any responsibility for supplying power beyond that incidentally generated at projects serving legitimate governmental functions.

"The question—the only question, as I see it—is whether there is left in American and particularly in our own industry the amount and quality of courage necessary to carry the battle to the enemy. Let us adopt a program plainly equitable and easy to understand. Let us stand up and fight for it—before legislative committees, executive agencies, yes, and on the public platforms and in the public forums of the nation, too—with a zeal and a cohesion which we have not always displayed. Let us do so in behalf, not of ourselves and our companies alone, but also in behalf of the 80% of American electric customers who are becoming wearier and wearier of being taxed to pay the power bills of the 20% minority. Will we accept the challenge?"

Economic Outlook

The long-range business outlook is excellent, providing we keep the hydrogen bomb under wraps and stay out of war, said Dexter M. Keezer, vice-president and director of economics, McGraw-Hill Publishing Co., New York. National income this year will run $390 billion, about $20 billion above the peak hit two years ago and $30 billion above last year. He expects this high level to continue into 1956 despite a possible 20% reduction in automobile production and no increase in the housing boom. Offsetting factor will be an expansion of capital investments.

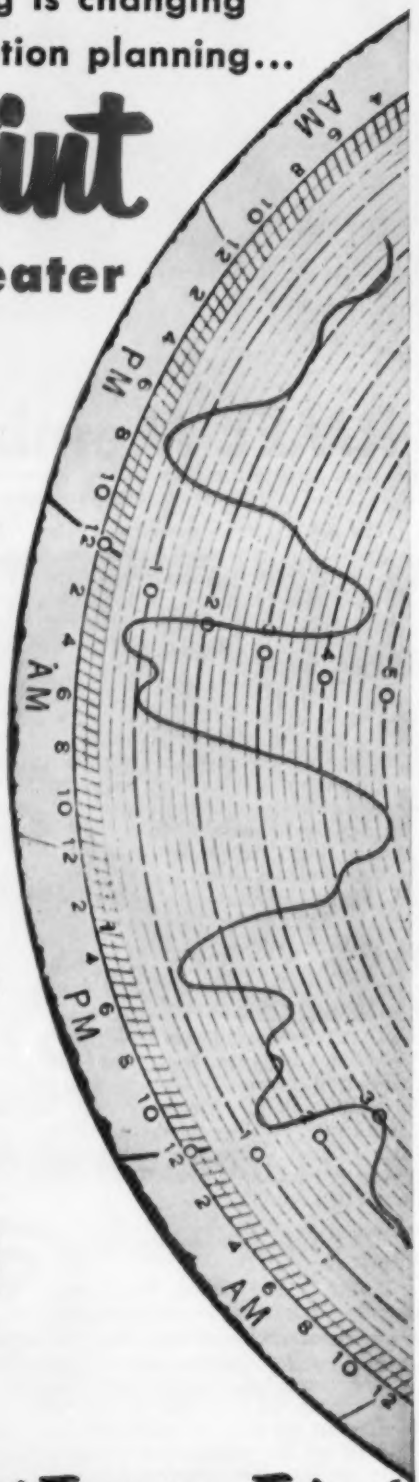
Present governmental steps to control credit are something to be watched carefully. Credit tightening can stop a boom but release of controls cannot turn it on again, he said. Keezer expects wage and price increases to continue but does not fear run-away inflation because of our great capacity to produce an abundance of everything.

One key place where expansion is in sight, said Keezer, is in business investments. We have confirming evidence of an expansion in capital investment. Schools and highways alone will require expenditure of $100 billion in the next five years—just to catch up.

He said: "I anticipate that some strong phases of our economy are going down in the period immediately ahead but I am equally confident that shortly ahead expansion will take hold again and we will roll into 1956 with a very expansive economy and a very high

Air conditioning is changing load and distribution planning...

Now Hotpoint Offers a Water Heater That Fits This New Load Trend!



the new Hotpoint super-speed automatic

A progressive idea in electric water heating—the new 40-gallon Hotpoint Super-Speed Automatic meets the maximum hot water needs of 95% of all users everywhere . . . provides more than 6 times the needs of the average family.

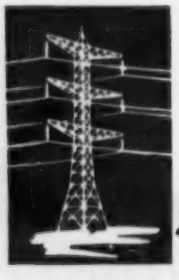
Actual laboratory tests have proved the new Super-Speed equals or out-performs any rated heater of comparable size, regardless of heat source. It can deliver 30% to 60% more hot water every 24 hrs. than a standard 82-gal. heater—60 to 90 gallons of hot water in less than 2 hrs.—up to 470 gallons every day! Recovery? From a cold start, with 50° water, it delivers enough hot water for 3 shower baths in just 25 minutes . . . enough really hot water for an automatic washer load in about an hour.

This fast recovery heater peaks at mid-morning when the residential load is usually low. In companies already providing, or contemplating, increased distribution facilities for air conditioning, this is a time when additional use of these facilities will be advantageous.

Of course load and demand figures must be related to your local situation. Many major utilities are now testing Super-Speed heaters on their lines. A limited number have already completely embraced this new fast recovery idea and are actively merchandising "better hot water service at no extra cost."

If you would like to see what the new Super-Speed will do for your load and merchandising picture—write to Utility Division, Hotpoint Co. The new Hotpoint Super-Speed program for utilities is completely flexible.

Again, Hotpoint



looks at Tomorrow, Today!

HOTPOINT CO. *(A Division of General Electric Company)* **5600 West Taylor Street, Chicago 44, Illinois**

Johnson Vennard

Thomas Hollingby

McDaniel Shoupp

level of prosperity." His controlling reason is that business is planning such a high level of capital investment for 1956, 57 and 58. Business has already planned capital investment for 1956 within 3% of this year. "That is unprecedented as an augury for prosperity. We have a slogan in my office, 'as goes captial investment, so goes prosperity,' and this has never failed."

G-E Sales Program

An all-out selling drive in which the entire industry is asked to participate was announced by Roy W. Johnson, executive vice-president of the General Electric Co., New York. He cited the favorable economic situation, the appliance manufacturers' capacity to produce many new or improved appliances for the home and the utilities' desire for new load as factors making the launching of a selling program most opportune. Outline of the plan will be found in the article on p 95.

Boost Residential Load Factor

Smart selling is placing your money where it will do you some good—improve your load factor, said Edwin Vennard, president, Middle West Service Co., Chicago. It is possible, he said, to design a five-year sales program that will average 89% load factor in residential service on the increased business sold. "We are neglecting a great market in the potential use of lighting in the home." He said this could reasonably increase four times and add 20% to residential consumption, making the average kilowatthours for a light-conditioned home from 2,000 to 2,500 per year. A 10% increase in residential load factor will produce 1% increase in return. Vennard made these suggestions: find out what your company is doing about residential lighting; put some responsible man in charge of residential lighting; make a survey and develop a program; teach women to buy light bulbs by the package. Residential lighting is a tremendous market, it is profitable, we have neglected it, we should go after it, he concluded.

"We cannot be contented if we are to make progress toward the day when every family will have upward of 100 electric servants in its home," said John F. McDaniel, vice-president, Hotpoint Inc., Chicago. He said installation cost of major appliances is still the biggest deterrent to sales, that planning must include greater emphasis on complete kitchens and laundries. Of the wired homes in America, 96% still have no dishwasher, 93% no electric clothes dryer, 95% no air conditioning and 82% no electric range. He said we must plan better merchandising, place greater emphasis on low-saturation appliances and pioneer as we have done in the past. The history of the industry verifies that the utilities must take the initiative in creating many new and undeveloped sales areas, said McDaniel. He feels that if we are to meet our competition and meet our challenge the industry must not be content but gear itself to the sales job ahead.

The greatest fear of J. B. Thomas, president, Texas Electric Service Co., Fort Worth, is that we will go to sleep through complacency. He said anything we do can be done better if we put our heads to it—that we must seek ways to do things cheaper and better. He cited a number of new practices within his own company as a result of the inquisitive minds of a challenge committee. Out of this has come ideas that have saved many thousands of dollars in the cost of new generating stations, much has been learned to improve operation and a pattern has been worked out that has great application in other parts of the business. Speaking of the distribution system as a typical problem, he said we would have to work out a practical underground system to replace the unsightly poles and wires in new additions. This is only one of the many facets of our business, including residential rates and customer relations that we must study and improve because we can't jog along in this age of jets, Thomas said.

McKee Brings His Directors

Paul McKee, president of Pacific Power & Light Co., Portland, who had brought his board of directors to the convention, said that more power is needed within the State of Wyoming and that his company plans a 100,000-kw steam plant to meet that need. The Bureau of Reclamation, whose revenue for years was almost entirely derived from power sales to the private utilities of the region, has now exhausted itself with preference customers and is forcing his company into supplying its own power needs with steam generation. He traced the history and administration of the preference clause, saying the only time preference means anything is when there is a shortage. He feels that more vigorous action must be taken to educate the American public to the unfairness and inequities of the preference clause. McKee paid a tribute to Dave Johnston and his staff at Casper and said that if commission approvals are granted the property managed by Bill Breslin at Laramie will become a part of the Pacific system.

Gros Off to Russia

Robert R. Gros, vice-president, Pacific Gas and Electric Co., San Francisco, said the point made by Harllee Branch, viz, "whenever the free enterprise system and the freedoms that support it in this country are threatened anywhere they are threatened everywhere," is the greatest of challenges to those of us who must get our industry over to the public. We must develop in the minds of the public of America the tremendous coincidence of our self-interest and their long-term interest. We fight against a minority, but an organized minority — an immensely highly articulate minority — when too many in our own industry run from the fight and are not willing to stand up and slug it out, as has been

1. The clean, corrosion-resistant exterior finish of Rome • EMT provides neat, long-lived installations for commercial buildings.

2. Compression-type fittings simplify installation, save time. Light weight of Rome • EMT makes overhead work easier.

3. Easy workability plus compression-type connectors make Rome • EMT easy to route through junction and pull boxes.

Rome • EMT is available for immediate shipment in sizes ½" through 2" from these 12 convenient warehouse points:

Atlanta, Ga.	Denver, Colo.	Rome, N. Y.	Seattle, Wash.
Chicago, Ill.	Kansas City, Mo.	Salt Lake City, Utah	St. Paul, Minn.
Dallas, Texas	Los Angeles, Calif.	San Francisco, Calif.	Torrance, Calif.

The bigger the installation,

the more you save

with Rome • EMT

This slick, shiny new interior in Rome • EMT lets fish tapes slide through with an absolute minimum of resistance.

The easier electrical metallic tubing is to work and to fish, the more time you save, and the more money you make.

If you haven't taken advantage of Rome • EMT in your work, you are missing a sure bet in this respect.

OUTSIDE—*clean, easy to work*

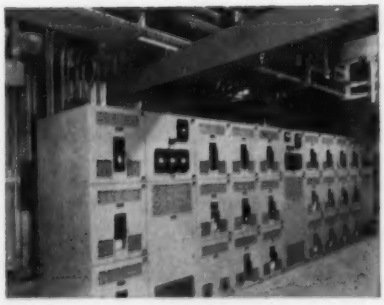
Rome • EMT saves man-hours of installation time. It's light in weight, easy to bend. It's designed for one-man handling, with threadless compression joints. Its clean, corrosion-resistant, nonflaking exterior finish gives you installations you'll be proud of for years to come.

INSIDE—*slick, easy to fish*

Comparative tests show conclusively that fishing is easier and faster through Rome • EMT than through any competitive conduit on the market. Its new inside finish cuts fishing time and effort to the minimum.

Get the mechanical, chemical and electrical protection of a top-quality EMT. And, to reduce your costs, get maximum ease of installation. For residential, commercial and plant wiring safety and adequacy, specify Rome • EMT and save.

For more details, contact your nearest Rome Cable office or warehouse.



4. Easily bent and shaped to building angles, Rome • EMT makes neat banks for high-voltage industrial installations such as this.

Informative, free booklet on conduit

The Rigid Steel Conduit and Electrical Metallic Tubing Section of N.E.M.A. has prepared an informative and helpful book on conduit. We'd be glad to send you a copy.

It Costs Less to Buy the Best

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and
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done by some of our industry leaders. Gros discussed his forthcoming trip to Moscow and the world situation, concluding by saying: "It is high time that we take a fresh look at the American balance sheet, that we stop just weighing our weaknesses and start totaling up some of our strengths. The question is not whether we dare risk war with Russia—the question is have we never learned that appeasement never means peace."

Top Drawer Job

Kenneth Haagensen, director of public relations, Allis-Chalmers Mfg. Co., Milwaukee, speaking first of the economic situation and the position of the farmer in particular, said the farmer has to go into a cost control and cost reduction program the same as industries have had to do if he is to improve his economic status. He must mechanize and modernize every farm operation and do as one Wisconsin dairyman has done—get rid of low producers in his herd and sell them for beef. Public relations is an area of selling, said Haagensen. "We are being compared every day with other services. Then why don't we make our service the best possible? In this field of public relations we haven't arrived until we are doing a top-drawer job on every level of public understanding and public contact; there should be no confusion on our objective; we must have a program and carry it out," he said.

Public Ownership Lost

Dixon-Yates in retrospect was presented by Paul Hollingby Jr., vice-president, Middle South Utilities Inc. He said: "We sincerely believe that the Dixon-Yates project brought about some tangible gain from the standpoint of the investor-owned electric power industry in particular and the American business system in general. The most prominent of these is that the government-ownership proponents actually lost the Dixon-Yates struggle. We found that congressional committees and subcommittees, when dominated by public-power zealots and business haters, apparently think nothing of harassing and, in extreme cases, even browbeating honest, well-meaning patriotic businessmen who attempt to do a job for the administration. We were disappointed in finding that these unbecoming tactics drew little attention from other congressmen who might have attempted to bring about fairer play."

Dr. W. E. Shoupp, technical director, commercial atomic power activities, Westinghouse Electric Corp., said that the atom offers unlimited power for the unlimited future. He analyzed

Johnston McKee

the world's energy supply; told of reactor development; said we now have seven instead of five reactor types as promising; expressed the belief that we will have competitive atomic power in the coal fields of Pennsylvania in seven years; said that atomic power looks promising in the field of transportation as well as that of power generation; that the hydrogen fusion process is promising as a future world energy source.

Dr. Preston Bradley, author and lecturer, said that the next 45 years will probably shape destiny for the next thousand years. He sees evidence that man is reaching one of those eras in world history when some drastic fundamental change is going to take place. He sees hope for mankind in the revival in all religions of world-wide scope.

At the concluding annual meeting of the league D. B. Hyer Jr., president of Southern Colorado Power Co., Pueblo, was elected president to succeed W. L. Breslin. Vice-presidents elected were Guy W. Thomas for Colorado, W. D. Johnston for Wyoming, R. D. Moody for manufacturers. Other officers were re-elected.

EMEA

Electrical Maintenance Engineers Association of Southern California elected Aubrey LaForce, Axelson Mfg. Co., its president as Jack Singleton, formerly of Lever Bros. Co., left to take a new job with Dow Chemical Corp. in Pittsburg, Calif. LaForce had been first vice-president and his place was filled by Mike Boyak of Stetson Electric Co., a director. To fill his vacancy Robert Marcum was appointed. R. W. Fletcher is program chairman now. The Sept. 21 meeting heard Frank Neal of Minneapolis-Honeywell Regulator Co. discuss "Application of Electronic Air Conditioning Control." The Oct. 19 meeting is scheduled as the annual Bosses' night, with a special program directed to them. In December the annual smoker is being planned.

Utah-Idaho NECA Learns of Growth

Substantial growth and a sounder financial status were reported to the members of Utah-Idaho Chapter, National Electrical Contractors Assn., at its annual Sun Valley meeting Sept. 2-5 by President Charles I. Berrell Jr. A total of 90 attended, including members and their families, for the combined social outing and business meeting.

Chapter membership had grown by 11 new permanent members and more than six temporary members working in the area. An increase in dues for chapter operation has placed the organization in better operating condition as well.

Berrell also reported the business outlook for Utah is one of unprecedented expansion in all types of work, industrial, commercial and residential, with rumors of a number of big industrial plants to be erected in the state. Activity in southeastern Idaho, however, was fairly quiet, he said.

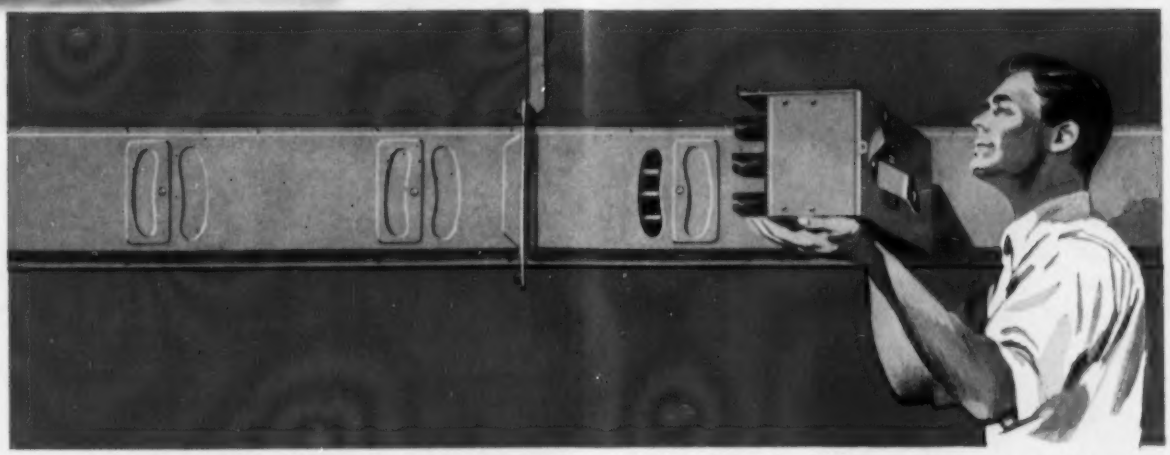
Also reported upon was the District 8 conference meeting held by Vice-president W. P. Robbins in Denver on July 29, particularly for ways and means to improve chapter services to members and provide a medium for exchange of ideas between officers of the chapters. The next Districts 6 and 8 conference of NECA, it was announced, will be held at Hotel Utah, Salt Lake City, May 3, 4 and 5, 1956, with Phil Robbins in charge.

The chapter passed a resolution opposing further extension of municipal, state or federal ownership of any business, particularly in the electrical field.

Paul Geary, executive vice-president of NECA, Washington, D. C., devoted one entire morning to an open forum discussion with members of NECA operations. Joe Bollinger, field representative for the district, presented the "Labor Cost Analysis" illustrated skit prepared by E. R. Cornish.

The electrical contractor's stake in electric home heating was discussed by Jack Neilsen, Westinghouse Electric Corp., Salt Lake City. He compared the various types of electric heating and answered the questions as to why contractors should sell it, whether it was too expensive, what kind to sell and how. He pointed out that electric heating would increase the contractor's profits five to one, give him a larger share of the building dollar, strengthen his position in the industry, help him sell more equipment and further the adequate wiring program.

Outside speakers included Marshall Shields, Boise Continental State Bank, who discussed contractors' financial



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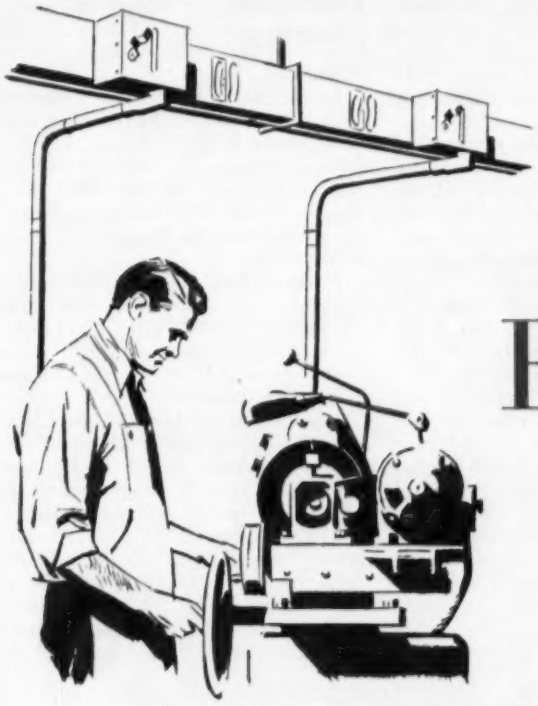

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Simple to install, rugged plug-in duct allows circuits to be swiftly added or removed without rewiring. Downtime is eliminated. New tool setups can be made, machines shifted, entire layouts revamped, without interrupting the flow of power. Also, duct can be easily dismantled and relocated.

Whatever your power requirement, present or future, you're always prepared with BullDog Plug-in Duct. You'll find BullDog your first source for the most efficient, most modern electrical distribution equipment. See your nearby BullDog Field Engineer or Qualified Distributor. Or, write: BullDog Electric Products Company, Detroit 32, Michigan. ©BEPCO

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problems and relations with bankers. Gene Fleming, General Electric Supply Co., Salt Lake City, presented the new financing plans offered by the General Electric Credit Corp. Floyd N. Shipp, chapter manager, handled the meeting arrangements.

IES

Charles D. Gibson, supervising field representative of the California State Department of School Planning, was elected to the grade of Fellow by the Illuminating Engineering Society and so honored at the IES national technical conference in Cleveland, Sept. 12. Unable to be present for the receipt of the emblem and certificate, the presentation will be made at a future Southern California Section meeting by Regional Vice-president Dan Finch, University of California, Berkeley.

Prof. Dan M. Finch, division of electrical engineering, University of California, and vice-president of the Illuminating Engineering Society, opened three of the fall section and chapter meetings and helped inaugurate the new officers. He did so for the Southern California Section Sept. 7, the Golden Gate Section, San Francisco, Sept. 14, and the Mother Lode Chapter, Sacramento, Sept. 22.

Professor Finch gave members food for thought when he reported that European standards of performance for street lighting are much higher than our own. Reporting first-hand observations made while he attended sessions as an official delegate for the International Commission of Illumination, Zurich, Switzerland, Professor Finch said he was much impressed with the progressive attitude, ability for research and well organized installation and maintenance programs he found in several countries he visited. For street lighting he found that Europeans have developed a high-pressure sodium lamp and that almost all of the mercury installations are color corrected. Fluorescent luminaires have a wide variety of shapes and designs to meet different specifications.

The meeting he attended attracted 700 official delegates from 59 countries, of which 32 were from the U. S. He himself had responsibility for commission work on standards, nomenclature, terminology, motor vehicle lighting, education in schools and professional training courses, as well as the work on comfort and quality of interior lighting. He visited nine countries and spent several days in the laboratories of Phillips Electric Co. in Holland.

In the Southern California Section he inaugurated Roy H. Kreyser, Department of Water & Power, Los Angeles, as chairman; George A. Hockenauer, Benjamin Electric Mfg. Co., vice-chairman; and Merle A. Potter, Smoot-Holman Co., Inglewood, secretary-treasurer.

In the Golden Gate Section Harold Wright, consulting engineer, was named chairman; Guy de Leuze, manufacturers' representative, vice-chairman; and C. W. Macy, PG and E, secretary-treasurer.

For the Mother Lode Chapter William Ross, G-E Lamp Division, was named chairman; Joseph K. Cannon, PG and E. vice-chairman; and G. E. Hersam, PG and E, secretary-treasurer.

British Columbia Section, IES, had its first meeting Sept. 12 as a Ladies Night, making a tour of the "Ease of Living Home" in West Vancouver. New section officers for 1955-56 were announced as J. H. Gilbreath, chair-

1955 Association Meetings Scheduled

October

1-8—**Northern California Electrical Bureau,** Electrical Exposition, Oakland Civic Auditorium.

20-21—**Northwest Public Power Assn., Power Use Section,** Seattle City Light Auditorium.

November

2-3—**American Home Laundry Mfg. Assn., National Conference,** Sheraton-Palace Hotel, San Francisco.

3-4—**Pacific Coast Electrical Assn., Business Development Section,** Huntington - Sheraton Hotel, Pasadena.

9-10—**PCEA - Hawaiian Section,** Honolulu.

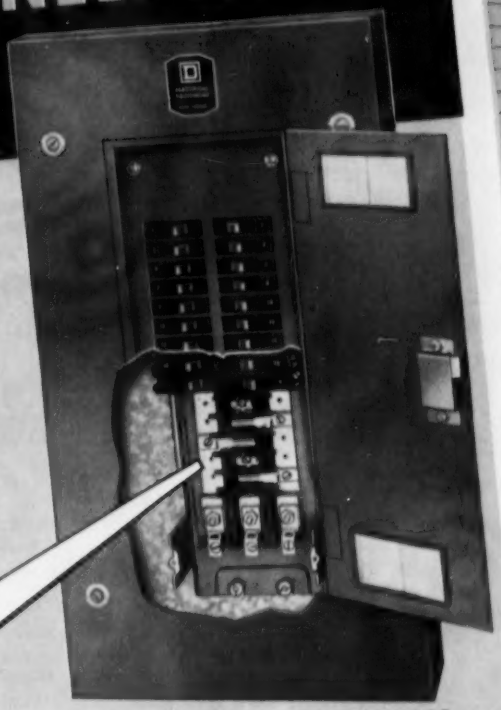
16-17—**PCEA, Administrative Services Section,** Californian Hotel, Fresno.

18-19—**Professional Engineers of Oregon,** Portland.

25-30—**Bureau of Home Appliances of San Diego, Electrical Home Appliance Show,** Balboa Park.

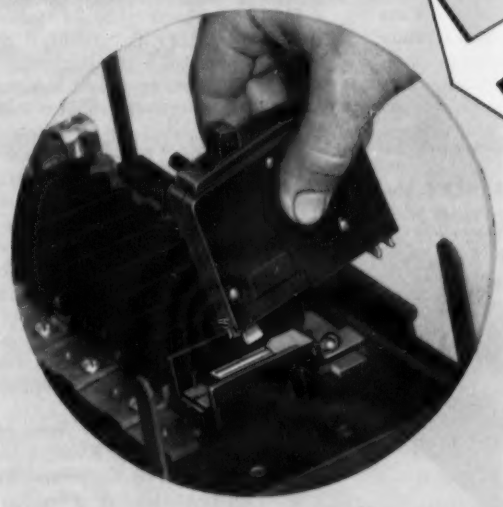
Terrific!

NQO LIGHTING PANELBOARD *with* QO... FINEST BREAKER EVER BUILT!



...Get the complete line "Off-the-Shelf" from your Electrical Distributor or have assembled panels shipped right to the job

It's a top quality line throughout! Note the compact, streamlined beauty. A closer look reveals such outstanding features as: Distributed phase bus arrangement with clear identification for simplified load balancing. Adjustable, indicating trim clamps. Galvanized box with large gutters for real accessibility, yet compact enough to mount between 16" wall studs. Most important of all—the new NQO panelboard offers you the finest breaker ever built, with exclusive **SWINGRIP** mounting.



NEW QO BREAKER
with Exclusive SWINGRIP mounting

No other breaker has all these features which make QO the finest breaker ever built!

- Plug-In for maximum flexibility as well as ease of installation and maintenance.
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- Compensated thermal trip enables breaker to carry full allowable load under varying ambient temperatures.
- Sensitive calibrated magnetic trip assures quick and consistent response to harmful overloads or short circuits.
- Non-interchangeable design discourages the use of 30, 40 and 50 ampere units where 15 or 20 ampere breakers have been installed.
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- Compact design—¾" width for each pole conserves valuable space.
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man; D. S. Gordon, vice-chairman; E. N. Kolbeins, secretary-treasurer.

Oregon Section, IES, had its kickoff meeting for the fall Sept. 21 and heard Charles R. Long, Pacific Coast lamp engineer, Westinghouse Electric Corp., discuss "What's New in Mercury Lighting?" New officers for the year were introduced.

San Jose Chapter, IES, introduced all new officers at its Sept. 28 meeting and heard a talk by R. G. Gardiner, PG and E, about the certified lighting program.

Inspectors

Hawaii Chapter, IAEI, took a holiday from its regular monthly meetings discussing the National Electrical Code by city electrical inspectors to visit the Hawaii Brewing Corp. Sept. 14 with electrical contractors and IBEWs as its guests.

Central California Chapter, IAEI, discussed the 1955 Electrical Safety Orders at its Sept. 10 meeting and introduced managers of Fresno wholesale houses, Tom Buckwell, Westinghouse Electric Supply, Marlo Denning, Incandescent Supply, and Doral Eardley, Graybar Electric.

Southern California Chapter, IAEI, visited the new color and black-and-white studios of National Broadcasting Co. in Burbank July 24, following a business meeting presided over by Harry Dobson, Santa Barbara.

Arizona Chapter, IAEI, is sending a questionnaire to the mayors and councils of all cities in the state asking whether they have electrical codes, whether they back the electrical inspector in code enforcement, whether there is an advisory board to determine policy and whether deviations should be allowed where large property holders or politically interested parties are concerned. Copies of a proposed state law to enable adoption of ordinances by reference to codes already printed is being proposed likewise.

Electrical Inspectors Assn. of B. C. had a report from L. Ryan, Vancouver city electrician, on the happenings and procedures at the recent code committee meetings in eastern Canada at its Sept. 19 meeting.

PEO

Professional Engineers of Oregon holds its 1955 annual state-wide convention in Portland Nov. 18-19. Among the important subjects programmed by President Paul D. Christerson are those dealing with the professional standing of the engineer. Several speakers are programmed on the topic from the professions of law and medicine to add their views.

"We've Found We Can Rely on Reynolds"

says Fred G. Hodge, Purchasing Agent,
Portland General Electric Company

Typical purchasing meeting of Oregon's pioneer electric utility, Portland General Electric has been serving the homes, farms and industries of Portland and the lower Willamette valley since 1889. Close to half the state's population is in PGE's compact, dynamic 2600 square-mile area.

Fred G. Hodge, *Purchasing Agent*

William H. Hayden, *Assistant Purchasing Agent*

Cecil G. Berning, *Buyer*

A. H. Skillin, *Buyer*

Frank M. Adams, *Buyer*

"We've found we can rely on Reynolds service whenever we need assistance—in our office or in the field," says Fred G. Hodge. "With Reynolds Aluminum we also feel assured that our orders will receive immediate attention and that shipping promises will be met. Reynolds nas given us prompt delivery of quality conductor on every job to date."

This is typical of the kind of service Reynolds delivers to utilities—service backed by Reynolds product development and production facilities. Put this service to work for you on ACSR, Covered Conductor (single, duplex, triplex or quadruplex), RABC (Reynolds Aluminum Bus Conductor) and other aluminum products.

Use this Reynolds service to complement your own experience and knowledge of the electrical field. Reynolds Engineers will be glad to meet with your entire staff and present complete information on all phases of electrical applications for aluminum. Remember, too, there are 33 Reynolds Electrical Distributors who are also at your service. Write for the name of the one near you. *Reynolds Metals Company, P.O. Box 1800-EK, Louisville 1, Kentucky.*

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MODERN DESIGN HAS ALUMINUM IN MIND

THE MONTH IN BRIEF

Trinity Start to Be in October

Plans to begin work in October on the $225,000,000 Trinity River project in California were discussed by Reclamation Commissioner Wilbur A. Dexheimer, Clyde H. Spencer, Region II director, and Congressman Clair Engle. The bureau has a $1,000,000 appropriation for the construction start. Dexheimer said studies of a partnership development offer by Pacific Gas and Electric Co. will not interfere with initial construction.

SMUD Bond Vote Set for December

Sacramento Municipal Utility District has decided on Dec. 6 as the date for an election on a proposal to issue $82,000,000 in revenue bonds for the construction of a 160,000-kw hydroelectric project on the upper American River.

Brownlee, Oxbow Plans Filed

Idaho Power Co. has filed final design plans for its Brownlee and Oxbow Dams on the middle Snake River with the Federal Power Commission. President T. E. Roach said: "The company is prepared to launch construction, under the terms of the license, immediately after commission approval is given."

PGE Plans Clackamas River Dam

Addition of 75,000 kw to its upper Clackamus River development is planned by Portland General Electric Co. The additional development would be in the form of an arch-type dam at the North Clackamus site, and 25,000 kw capacity added to the downstream Faraday power house.

Kings River Design Change Sought

Increased generating capacity and lower cost would be gained by adoption of new plans for the Kings River hydro project of Pacific Gas and Electric Co. The company has applied to the FPC to amend the original plans to include an underground chamber for Haas power house instead of building A. E. Wishon power house. Savings would be about $900,000 and additional capacity would be 2,000 kw.

Los Angeles Peak Record Broken

System peak records for Los Angeles area utilities rose about as high as the temperatures in late August and early September. Southern California Edison's previous system peak record of 2,118,500 kw was broken twice, first on Aug. 31 with 2,125,900, and again on Sept. 6 with 2,205,800 kw. Los Angeles Department of Water & Power system peak climbed to 993,000, about 4% above normal.

Oregon Town Eyes PP&L Property

The utility board of Springfield, Ore., has authorized engineering studies to determine whether the city should acquire competing facilities of Pacific Power & Light Co. As the situation is, the city serves most residential customers and the utility serves commercial and industrial firms.

Heco Announces Five-Year Plan

Hawaiian Electric Co. Ltd. has announced that its plant expenditures for 1955-60 will be $44,843,000. A new 50,000-kw unit for Honolulu power plant is included, and the first of two 50,000-kw units for Waiau station. It is expected that $33,553,000 will be raised through outside financing. The first step of the finance plan is the sale of 250,000 shares of series F cumulative preferred stock in 1956. Par value is $20.

Interruptibles May Be Cut Back

Bonneville Power Administration was warning interruptible industrial customers and private utilities of possible power cutbacks at press time. Average river flows in October would allow BPA to meet 80% of such loads but critical level hydro flows would mean dropping 257,000 kw from deliveries to utilities and up to 446,000 kw to industrial customers. A report from Marshall L. Blair of Washington Water Power Co. states that Northwest power sources are drawing on their storage reserves at least 10 days earlier than usual. Drawdown of reserves started Aug. 1.

Four Dams Studied by Snohomish

A preliminary FPC permit has been granted to Ronald D. Taft for a proposed hydroelectric project on the south fork of the Stillaguamish River, Snohomish County, Wash. Snohomish County PUD, Bonneville and industrial users would get the power from the four-dam project. Installed capacity would be 85,000 kw.

New Service Center in Yuma

Arizona Public Service Co. recently completed a new district service center in Yuma. Costing in excess of $190,000, the installation houses all district operating departments and a warehouse. The installation is called a complete "lighting laboratory," with each office featuring a different lighting scheme.

Pearl Says PNW In Better Shape

Dr. William A. Pearl told members of the Columbia Basin Interagency Committee that new generating installations in the Pacific Northwest will help with the region's power supply this year, as compared with 1952-53.

YOUR INDUSTRY is served by a team of Shell Lubrication Specialists, every man an outstanding expert. Call in any member of this team and you benefit by Shell's *quarter-century of documented experience* with lubrication problems in your field!

Shell's men and techniques —with SHELL DIALA OIL AX—can help you

Slash sludge clean-up expense

Sludge damage costs more than it need to ...unless you're using Shell Diala Oil AX. Developed by Shell Scientists, Shell Diala Oil AX is a near-perfect combination of Shell's own highly effective inhibitor and a special base oil. It can keep your equipment sludge-free *years* longer!

When Shell Lubrication Specialists prescribe Shell Diala Oil AX, you benefit by all of Shell's scientific study and experience with lubrication problems in your field. Shell Diala Oil AX—used as Shell recommends—can put sludge at the bottom of your list of transformer problems.

It will pay you to call your Shell Lubrication Specialist today!

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THIS MONTH'S NEWS

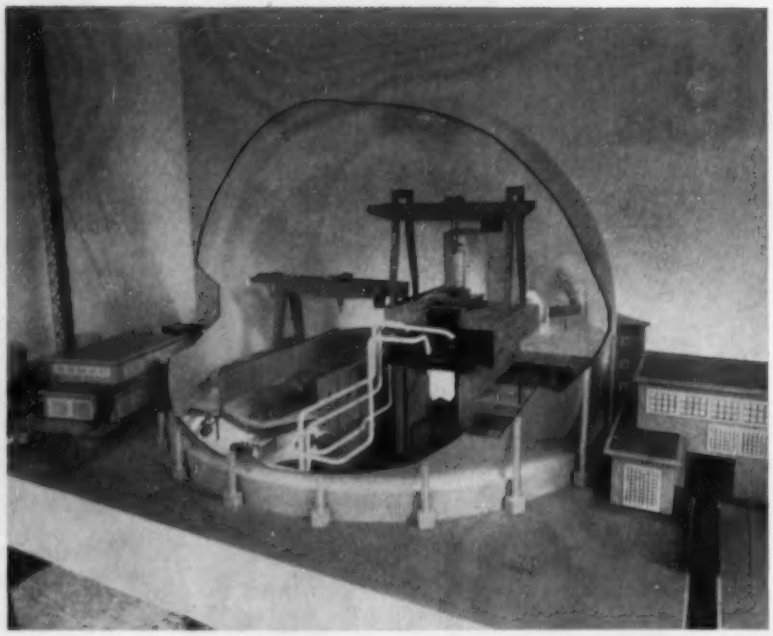
G-E Moves Atom Plant Designing to Coast

Headquarters for design and engineering of the nation's first nuclear power plant have been moved from Schenectady, N. Y., to San Jose, Calif.

The plant, a joint project of Commonwealth Edison, General Electric Co., Pacific Gas and Electric Co., Bechtel Corp. and others, will be built on the Illinois Waterway, 47 miles southwest of Chicago, and will be owned and operated by Commonwealth.

By moving the design and engineering headquarters to San Jose, liaison will be closed between the G-E, Commonwealth and Bechtel personnel assigned to the project. A staff of 25 has moved into the G-E motor plant in the new headquarters and 70 more will be added by the end of the year. It is expected that still another 100 persons will be on the project by the end of 1956. Completion is expected in 1960.

In the meantime, the public is being introduced to the proposed plant by means of a traveling exhibit that appeared at the California State Fair in September. Shown are models of the plant and of the reactor. Pacific Gas and Electric Co. sponsored the California showing.



Models of Nuclear Power Group's atomic powered plant (above) and its General Electric reactor (right) were seen at California exhibit sponsored by Pacific Gas and Electric

• **Bureau of Reclamation** has initiated water gaging studies of the Yukon River to get an indication of hydroelectric potential.

• **A new $160,000** service center for the Grand Junction division of Public Service Co. of Colo. is now in service.

• **Chelan County PUD** in Washington reports that economic and engineering studies of the 595,000-kw Rocky Beach project on the Columbia River are far enough along to anticipate application for an FPC construction license by the end of this year.

• **A trial is under way** in Thurston County Superior Court at Olympia, Wash., to decide whether the Washington State game and fish commissions will secure an injunction to stop the hydroelectric development of the Cowlitz River by Tacoma City Light. The State Power Commission has intervened in behalf of Tacoma.

Chudoff Stirs Anger In Three "Hearings"

The House of Representatives government operations subcommittee on public works and resources left a wake of angry sentiment as it sailed through hearings at Denver, Idaho Falls and San Francisco.

Democratic Rep. Earl Chudoff, chairman of the group, was accused of everything from "prejudging" testimony to railroading the one-sided hearings to gather 1956 campaign material for the Democrats.

Bearing out claims of unfairness were several facts. In Denver the subcommittee heard only witnesses supplied by REA groups. In Idaho Falls four witnesses appearing and 12 others represented by written statements were critical of the Department of the Interior, with none appearing to represent the administration or the department, and none invited. In San Francisco the hearings were loaded with representatives of municipal utilities, and with Pacific Gas and Electric Co. on the hot seat.

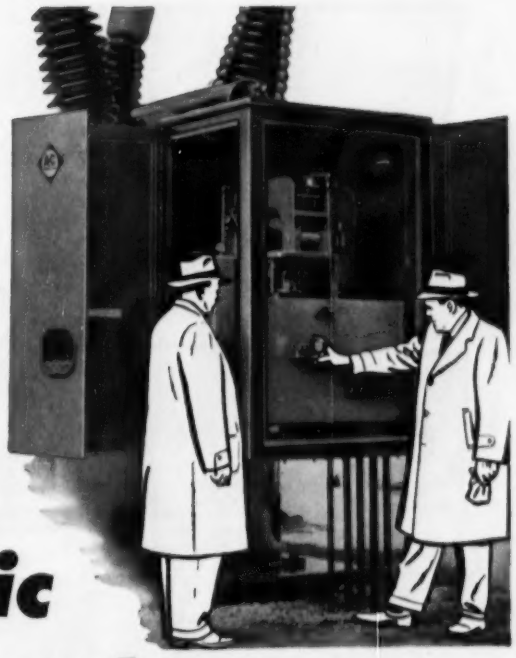
Rep. Charles Jonas (R-N. C.), a member of the subcommittee, said: "This investigation is being used merely to develop propaganda for the election next year. This is the most ruthless deal I ever got mixed up in. The Democratic majority has its staff investigators go around and drum up witnesses whose complaints we haven't even been given the courtesy of viewing."

The subcommittee heard only witnesses with complaints against the Department of the Interior. A request by Jonas that a witness making a charge be answered by a defending witness

(Continued on p 132)

Questions and Answers

about the Pneu-Draulic Circuit Breaker Operator



Pneu-Draulic operators can be furnished on power oil circuit breakers from 14.4 kv, 500,000 kva to the largest.

Following are answers to questions that have arisen during discussions of the *Pneu-Draulic* operator. Perhaps they may answer some of the questions in your mind.

Q. What happens if the accumulator bag breaks?

A. While breakage is unlikely, surprisingly enough the breaker would continue to operate normally for a period of approximately a year. The high pressure oil would slowly absorb the nitrogen charge.

Q. How long will the accumulator bag last?

A. Allis-Chalmers had about ten years' experience with the identical accumulator on rock crushers without replacement. On these units there are about one million flexations of the bag each year.

Q. Can accumulator bladder pressure drop low enough due to extremely cold weather to prevent operator from closing breaker?

A. No. There is enough oil reserve in the reservoir to make up for any drop in nitrogen pressure in the accumulator.

Q. What maintenance will be required?

A. The very minimum. All that is required is that at least once each year the oil level in the reservoir and precharge pressure in the accumulator should be checked.

Q. The control valve is immersed in oil and shouldn't stick — but if it did when the ram was in the top position, could the breaker trip?

A. Since all Allis-Chalmers breakers are mechanically trip-free, the breaker would open at its normal operating speed.

Q. How much oil leakage can be expected?

A. Field experience to date proves no external leakage need be expected. Internal leakage from high to low pressure portion of system will be about .4 cubic inches per hour maximum. This means pump will operate about one minute in 24 hours.

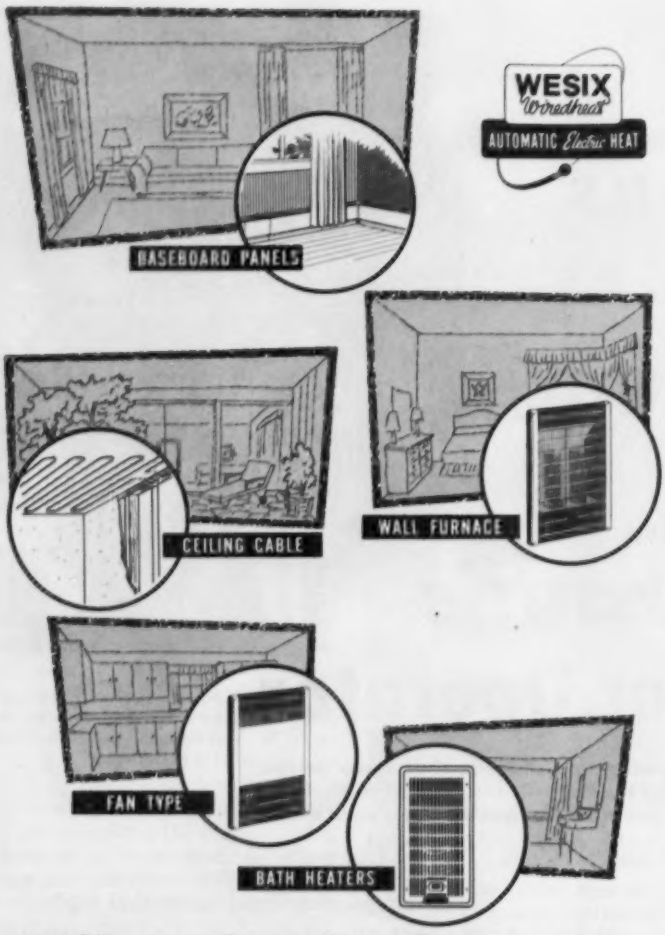
Q. Is there danger to operating personnel if an oil line should break?

A. No more than with an air line in a pneumatic system. However, the greatest safety factors possible have been incorporated. From a pressure standpoint the *Pneu-Draulic* operator meets all requirements of the Joint Industrial Conference on Hydraulics and Army and Navy specifications; safety factor is 5 to 1, based on a 3000-psi system. In addition, a pressure relief valve is incorporated to prevent excessive pressure if pressure switch should fail to shut off pump.

If you have any further questions regarding the *Pneu-Draulic* operator, or would like a copy of the new Bulletin 71B7942, contact your nearby A-C office, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4779

Pneu-Draulic is an Allis-Chalmers trademark.

ALLIS-CHALMERS



Sell comfort by the room ...the WESIX WAY

Modern living has already made "central heating" old fashioned. The modern home must be "furnished" with heating just as it is with furniture...room by room. For each room with it's special activity must be provided with heating to solve its special heating problems.

In the living room your customers prefer the perfect comfort of gentle perimeter heating with modern WESIX automatic electric Baseboard Panels. In the bedrooms...where we all spend nearly a third of our lives...suggest the healthful comfort of WESIX-IONIX Wall Furnaces to destroy pollens and airborne bacteria and to restore natural "ion balance" to indoor air. Then in the kitchen or laundry recommend WESIX Fan Type heaters; in the bath, the penetrating radiant heat of WESIX Bathroom Heaters; in the lanai or in open halls, the out-of-the-way warmth of Wiredheat Ceiling Cable.

Only WESIX, the world's largest and most imitated manufacturer of electric heating equipment, can give your customers the *selection* that insures perfect heating comfort because only WESIX makes more than *fifty* different units to solve every heating problem.

WESIX ELECTRIC HEATER CO.

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Chudoff Accused Of Propaganda Gathering

Story starts on p 130

was repeatedly denied by Chudoff. At Idaho Falls, Chudoff refused the request with "I am the chairman and I make the rules."

In Colorado, REA spokesmen said the Rural Electrification Administration forced a Colorado cooperative, the Colorado-Ute Electric Assn., into a "shotgun wedding" with Western Colorado Power Co. They referred to an agreement where Colorado-Ute builds a generating station that is to be operated by Western Colorado Power. The REA speakers said they were forced into the partnership in order to get an REA loan for the plant.

Public power users in Idaho charged that federal power generated in the Intermountain area is being delivered to private companies at dump rates, while preference customers, such as publicly owned systems, are being denied priority. They asked for federal transmission lines to extend from the Columbia River to southern Idaho.

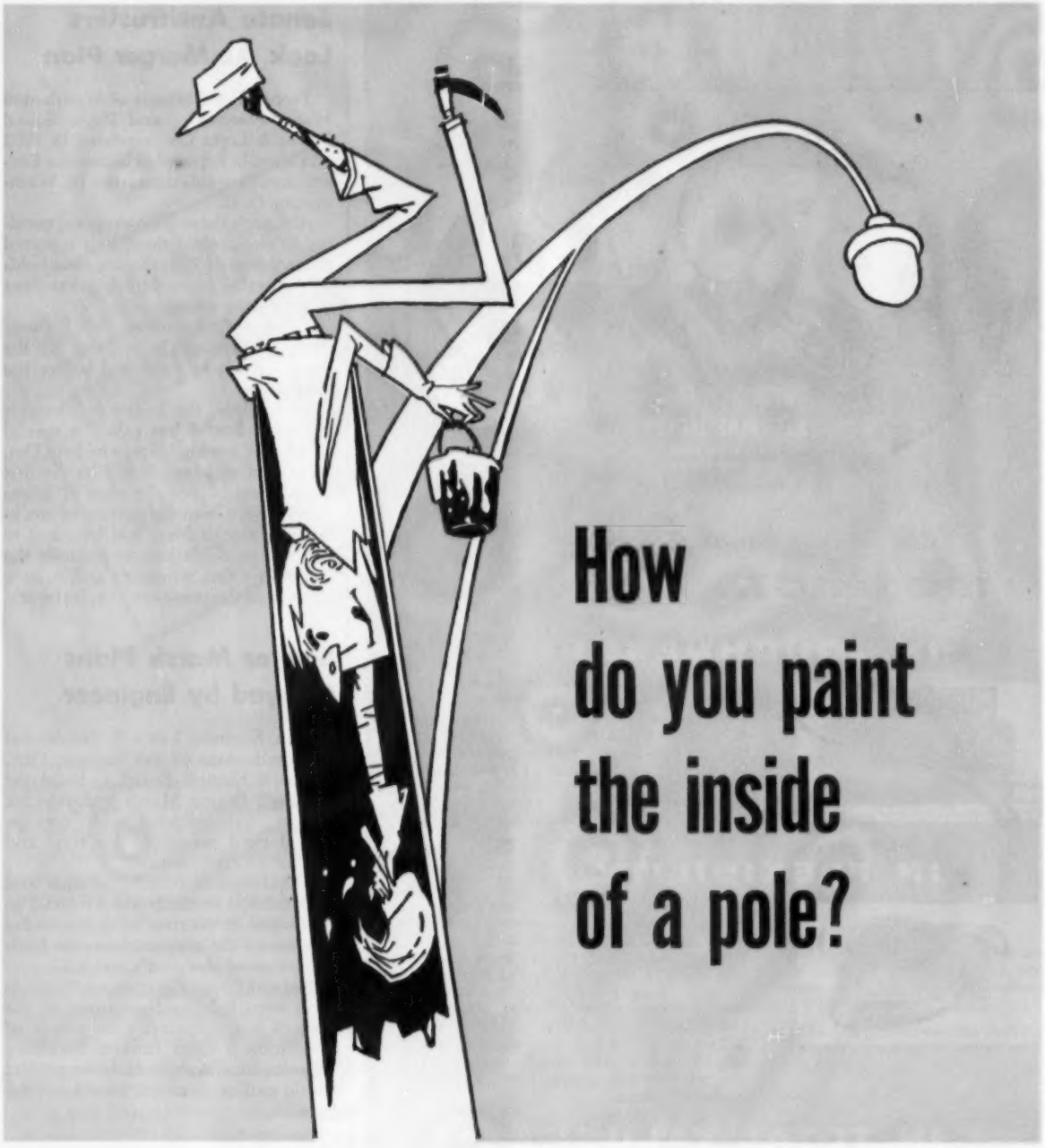
In California, the single case of the appearance of nonpublic power advocates before the subcommittee, Pacific Gas and Electric Co. was accused by Chudoff of influencing Interior Department policy on rights-of-way for transmission lines over public lands. He said the Interior Department changed its policy in August 1954 to conform with suggestions submitted by PG and E.

Most important change, Chudoff said, was "complete elimination of the requirement that the right-of-way holder allow federal government to wheel federal power over the line to agencies and customers to the extent of any excess capacity in the line not needed by right-of-way holder."

Now, he charged, the government is selling power at dump rates to private companies, who sell it to co-ops and municipalities at higher rates. Of the 13 changes made in the regulations, Chudoff said, 10 were copied verbatim from "that famous anonymous document which later was revealed to have been submitted by PG and E."

Herman C. Kruse, speaking for PG and E, strongly objected to this description of the document, pointing out that the suggestions had been compiled by Montana Power Co., Utah Power & Light, Idaho Power Co., Public Service Co. of Colorado, as well as PG and E, and delivered to Clarence Davis, Under-Secretary of the Interior, at the request of Davis.

Charges gathered by Chudoff were to be answered by the Department of the Interior at Washington hearings.



How do you paint the inside of a pole?

The answer is—you don't. Consequently, if the pole is made of corrosive metal, rust accumulates in the damp interior and weakens the wall, even though the exterior is regularly painted and maintains a deceptively fresh appearance. Rust scales pile up in the base, accelerate corrosion, endanger the insulation of the wiring, and greatly reduce the impact resistance of the pole.

Hapco Aluminum Alloy Poles don't deteriorate with age. They stand up through all kinds of weather, under the severest atmospheric conditions. They never require painting or other treatment to prolong their life. And their *installed* cost, due to their light weight and easy handling, is much less than that of ordinary metal or concrete poles.

HUBBARD ALUMINUM PRODUCTS COMPANY

Division of Hubbard & Company
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portable electrical cords and cables

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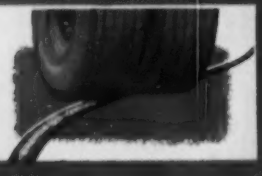
• IN TOUGHNESS!

More Neoprene than ever before—67.32%—with Neoprene content Certified by a registered professional engineer—makes Bronco 66 Certified the toughest cable ever placed on the market. More Neoprene. More value. More protection . . . against oil, flame, gasoline, sunlight, ozone, heat and cold, acids and alkalies, abrasion—all the elements found in industry which are the natural enemies of cords and cables.



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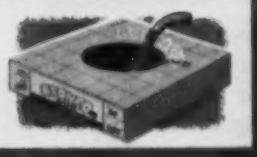
A completely new Synchro-Cure process—a method of vulcanization used only by Bronco—has been developed for use with Bronco 66 Certified. As a result, you can see a new look of quality in the tough, satin-black jacket. You can feel a new flexibility and resilience when you flex a piece of Bronco 66 Certified, even though it's a big #1, 4 conductor cable. Tests have proved that Bronco 66 Certified is 20.33% *more flexible* than the average of all competitive cords tested, including widely-advertised brands.

• IN TOTAL VALUE!

BRANDED JACKETS—branded every two feet.
NEW CARTON with knock-out center.
LARGE EASY-TO-READ labels.
CABLES on 250', 500', 1000' returnable reels.
FULL RANGE of types and sizes:
types SO, W, G, Control Cable, Welding Cable, SJO, SV-Neoprene . . .



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Senate Antitrusters Look At Merger Plan

Proposal of a merger of Washington Water Power Co. and Puget Sound Power & Light Co. instituted in 1952 was aired in September before the Senate antitrust subcommittee in Washington, D. C.

Although there is no proposal pending at the present time, it is reported that a group of Puget Sound stockholders favorable to the idea is attempting to revive the merger plan.

Kinsey M. Robinson, WWP president, spoke strongly in favor of the merger when he appeared before the committee.

Meanwhile, the board of directors of Puget Sound has called a special meeting of stockholders to be held Oct. 20 at Boston, Mass. It will be the first in two years, since the start of litigation by the pro-merger group of stockholders. Stockholders will be asked to approve modifications to approve the company's first mortgage and a 50% increase in the company's capital stock.

Beaver Marsh Plans Okayed by Engineer

State Engineer Lewis A. Stanley has approved plans of the Eugene, Ore., Water & Electric Board to build the proposed Beaver Marsh hydroelectric project, but included with the approval rigid provisions for time and method of construction.

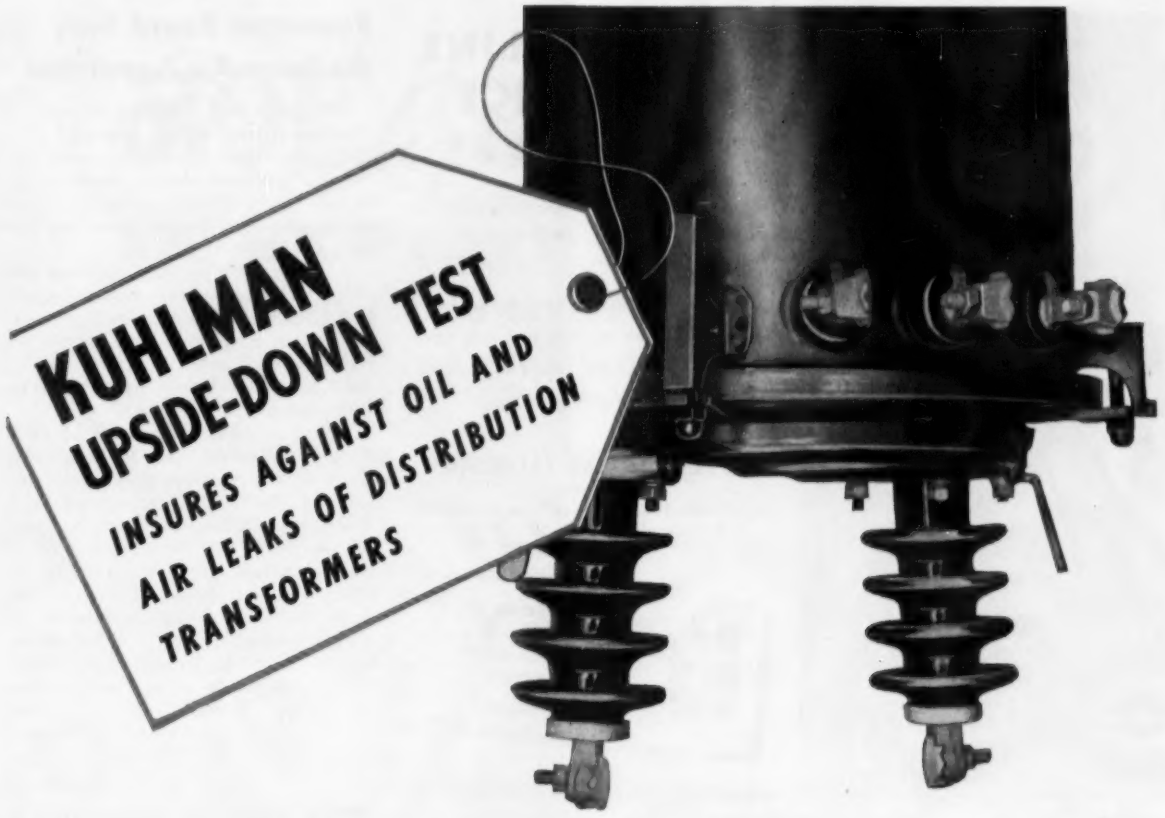
Requirements relating to time and construction methods are involved in protection of the river's fish life, as are limitations the state engineer set forth on release of the river's water.

Federal Power Commission hearings have been held and approval of the project is anticipated. One source of opposition is from Interior Secretary Douglas McKay, who feels the project would spoil recreational features of the area.

Arizona, Salt River Renew Service Pact

Salt River Power District and Arizona Public Service Co. have signed a power coordination agreement redefining the territory each utility is to serve and providing for further sales and interchange of power between the district and Arizona Public Service.

The new agreement brings up to date a similar 50-year compact between the Salt River Valley Water Users' Assn. and Central Arizona Light & Power Co. originated in 1928.



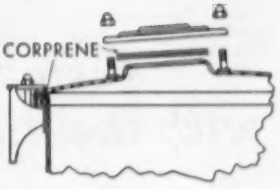
In addition to the thorough and exacting tests required by NEMA Standards*, all KUHLMAN Distribution Transformers up to 50 KVA receive a special upside down test, followed by a pressure test for air-tight, leak-free operation. First, the transformer is rotated 360° in a vertical plane to make sure there are absolutely no oil leaks, particularly in the vulnerable spots above the normal oil level line, where leaks are almost impossible to detect with the transformer in an upright position. Then a pressure test under simulated operating conditions prior to shipment provides a final check against oil and air leaks. Transformers above 50 KVA are pressure tested and checked for oil and air leaks with an electronic leak detector. KUHLMAN also spot tests all distribution transformers for impulse, audible noise, radio noise, and power factor in addition to NEMA requirements.*

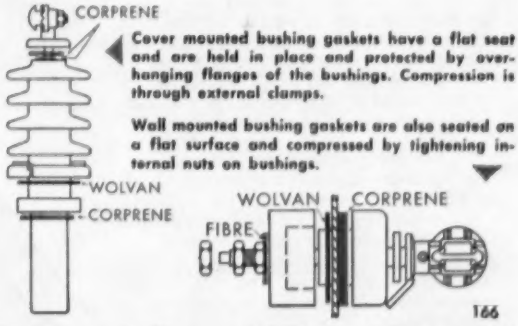
*KUHLMAN Distribution Transformers are tested as required by NEMA Standards for:

- winding resistance
- ratio
- polarity
- phase relation
- no load loss
- exciting current
- impedance
- load loss
- temperature
- applied potential and induced potential

Here is why KUHLMAN Distribution Transformers are air-tight, leak-free and moistureproof:

Cover and hand hole cover corprene gaskets are under constant uniform pressure insuring a permanent air-tight seal.





Cover mounted bushing gaskets have a flat seat and are held in place and protected by overhanging flanges of the bushings. Compression is through external clamps.

Wall mounted bushing gaskets are also seated on a flat surface and compressed by tightening internal nuts on bushings.

KUHLMAN

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Davey is doing line clearing for 12 Public Utilities on the Pacific Coast —most of them served continuously for over 20 years. Davey specialized equipment and efficient methods save money . . . Davey surgical pruning benefits trees—builds goodwill.

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DIVISION OF
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Story Bldg., Los Angeles, TUcker 1929

fustest with the mostest...

. . . gains many a victory — for manufacturers as well as for the military. In photoelectric lighting controls, for example, Fisher-Pierce was among the first (1945-6) to give street lighting engineers a sound, *dependable* group of controls.

But being among the "fustest," (or "pioneering," as ad men say), isn't in *itself* so wonderful. What it *does* mean is that every Fisher-Pierce control today represents nearly ten solid years of design improvement and millions of hours of actual use. And *that*, to the person who pays the bill, *is* important. Fisher-Pierce will be glad to furnish complete information and technical data.

THE FISHER-PIERCE COMPANY, INC.
43 Pearl Street, So. Braintree, Boston 85, Mass.

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Philips Export Corp., 100 E. 42nd Street, New York 17, N. Y.
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Resources Board Busy As Soon As Appointed

Oregon's State Water Resources Board, a master agency created by the 1955 legislature to resolve conflicts existing between varied resources interests, faces a full work load and major decisions by the time the law becomes effective Jan. 1.

Lewis A. Stanley, state engineer and chief technical officer of the organization, told the group at its first meeting that it may have applications for hydroelectric project permits on the table for action before a policy can be formulated.

Board members appointed by Gov. Paul L. Patterson, are: H. E. Maxey, Springfield newspaper publisher; L. C. Binford, Portland, former Isaak Walton League president; Donald Lane, secretary of the Oregon legislative interim committee on water resources; John W. Davis, former Bonneville official; Robert H. Foley, member of the Upper Columbia Basin Commission, which will be abolished; Fred Merryfield, professor of sanitary engineering at Oregon State College; Wayne Phillips, Baker cattleman; and Robert Root, Medford fruit farmer.

PUD Tries to Acquire Puget Sound Property

The Douglas County PUD of Bridgeport, Wash., is attempting to acquire the Rock Island Dam and power house of Puget Sound Power & Light Co. on the Columbia River with three condemnation suits.

The PUD filed petitions in eminent domain in both Douglas and Chelan Counties and also intervened as a defendant in condemnation proceedings instituted against the same property by Chelan County PUD five years ago.

Involved is the dam and four 20,000-kw generators owned by Puget Sound, with the generators housed in the same plant with six Chelan County PUD units.

Sub Fire Is Costly And Causes Outage

Dorris, Calif., was temporarily without electric power recently when fire knocked out two transformer banks of California-Oregon Power Co.'s substation for the community.

V. W. Hammond, distribution engineer for the company, said the cause of the fire has not been determined. Damages were estimated to be about $60,000, including total loss of the building.

MOE *light*

IS EXPANDING...

TO SERVE YOU BETTER!

TO MEET THE EVER INCREASING DEMAND!

NEW LOS ANGELES FACTORY...

This modern, new plant and showroom located at Los Angeles, Calif., represents a pledge to all Moe Light and Star Light distributors—no matter how fast the demand for Moe Light and Star Light fixtures *continues* to increase, production *will* keep pace with demand . . . quality *will* be maintained, for it is *quality* that has helped make Moe Light the leading home-lighting manufacturer. Furthermore, Moe Light, because of their new facilities, will speed-up service to all their West-Coast distributors.

New West Coast Plant and factory showroom opens November 4th

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A. O. GROTENHUIS, *personable regional manager of Moe Light, invites you to visit the new Moe Light west-coast factory and showroom.*

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than any other type multi-outlet system

PROVED . . . .
on thousands of installations!

1. ***Easiest to install.*** Plugmold raceways can be attached to *any* surface — feeds anywhere along its length.
2. ***Fastest to install.*** Snapicoil ready-wired receptacles *snap* into Plugmold raceway.
3. ***Permanent.*** Snapicoil receptacles are flush with *life-time Plugmold steel raceway.*
4. ***Inconspicuous.*** No bulky feed boxes, no protruding receptacles. Plugmold raceway can be painted to blend with color scheme of room.
5. ***Provides Better Electrical Service.*** 3-wire duplex receptacles, with one side switched and one hot; 2-wire duplex receptacles with both sides hot; NEMA 2-wire, grounded receptacles — all 3 services fit the one Plugmold raceway.
6. ***Many More Outlets at Minimum Cost.*** Duplex outlets are conveniently located every 60", 30" or closer.

For full information, write to Dept. M10

THE WIREMOLD COMPANY
Hartford 10, Connecticut

Loiseau Turns Ground To Start New Station

The growth of operations of the Public Service Co. of Colorado was dramatized in September with a formal groundbreaking for a new 100,000-kw generating steam-electric station, and also flipping a switch that put a recently completed 100,000-kw addition to Arapahoe station on the line.

President John E. Loiseau said, as he turned the first spade of earth for Cherokee station, that Denver was growing so fast the power from the new station will be needed by mid-1957 when it is ready for service.

Survival Doubtful Of Echo Park Dam

U. S. Commissioner of Reclamation Wilbur Dexheimer recently said in Denver that proposals to construct Echo Park Dam as a part of the Upper Colorado Storage Project appear dead.

"Unless there is some unusual occurrence, I don't think the House of Representatives would approve the . . . program with inclusion of Echo Park." He added that he expects Congress to pass the Upper Colorado bill next session.

Without Echo Park, funds for other projects in the program would be reduced, Dexheimer stated, because of less power revenues.

People Will Choose Between PUD and WWP

Voters of Stevens County, Wash., will decide in November whether they will receive electric service from Washington Water Power Co. or the county's Public Utility District No. 1.

By prearrangement between the two managements, the PUD advertised its properties for sale in September and Washington Water Power in turn submitted a bid of $2,750,000. If three-fifths of the voters approve the sale in November, the PUD properties will be transferred to WWP.

If voters do not approve the sale, then it is agreed that a decree will be entered in county court whereby the PUD will acquire the properties of WWP in the county for $3,100,000.

• **Pacific Northwest Power Co.** has asked the federal government for permission to develop 1,446,000 kw of new hydroelectric power on the middle Snake River. In two projects, Mountain Sheep and Pleasant Valley, the organization of four utility companies will ultimately spend $210,000,000.

EXTRA Holding Power
QUICKLY Installed
TOUGH For long life

EVERSTICK ANCHORS

For new construction and maintenance —Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resilient, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

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MICA?
—Whatever you want, we have it!

- **Y-26 HIGH HEAT MICA PLATE** Composite bonded, for heater appliances. Sheets or stampings.
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- **MICA MOLDING PLATE** *(Thermoplastic)* Sheets, stampings or molded forms.
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- **FLEXIBLE MICA PLATE** *(Cold Forming)* Sheets, or combined with Fiberglas, paper, cloth.
- **MICA TUBING** Any diameter and wall thickness, or sleeves and bushings.
- **MICA TAPE** Any thickness or width, combined with paper, silk, rayon, cellophane, Fiberglas.

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NEW ENGLAND MICA
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Red Throat

B-M 21 B, THE NEW INSULATED THROAT INDENTER CONNECTOR FOR E. M. T.

Four Ways Finer

1. Protruding rounded red plastic lip of bushing prevents cutting of insulation—eliminates shorts.
2. Full thread screws into all conduit fittings. Lip of RED THROAT bushing protects thread from damage.
3. Deep dished eight pronged lock nut is easier to drive on—screws flush to shoulder and digs into metal of box for vibration proof positive ground.
4. Permanent locked-in bushing insures smooth burr-free raceway for easy fishing. No extra work and costs no more.

Briegel, the Original Indenter Fittings are neater in appearance, easier and faster to use. Installation is simple and less expensive. Two quick squeezes sets them forever. Try B-M Indenter Fittings and get more profits from each job!

ALL BRIEGEL FITTINGS ARE U. L. APPROVED AS CONCRETE-TIGHT

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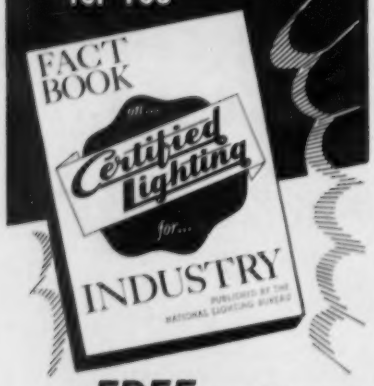

THIS **FREE** FACT BOOK TELLS YOU HOW

Surveys show that 17 out of every 20 stores, offices and industries suffer from sub-standard lighting. To reap the harvest of this vast potential business, electrical contractors, lighting manufacturers and distributors, utilities and others in the lighting industry are now beginning an all-out campaign on Certified Lighting under the leadership of the Northern California Electrical Bureau.

Now is the time for you to plan your own sales promotion to tie-in with this outstanding advertising and publicity campaign to bring lighting installations up to standards recommended by the National Lighting Bureau.

Use the coupon below to obtain additional information on this industry-wide program. Don't delay —it's under way.

NORTHERN CALIFORNIA ELECTRICAL BUREAU

Northern California Electrical Bureau
1355 Market Street, San Francisco 3

Please send me full information regarding the Certified Lighting program and how I may tie-in for bigger profit opportunities.

Name .....

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City ..... State .....

Industrial Firm Pays For Transmission Line

Construction of a transmission line and substations to serve a primary aluminum mill proposed by Harvey Machine Co. near The Dalles will be financed by the company.

An agreement between Bonneville Power Administration and the new aluminum producer was announced Sept. 12.

Harvey Machine will advance $2,038,000 for construction of the facilities and in return gets rate savings to the extent of normal BPA transmission charges. Bonneville will build the lines and they become property of the government upon completion.

The plant is planned to have a production capacity of 100,000,000 lb of primary aluminum annually and will cost about $65,000,000.

Army Denies Reducing Of John Day Storage

The Army's board of engineers for rivers and harbors has turned down proposals to reduce the amount of flood control storage of John Day Dam project until the Corps of Engineers can show how they would make up the 1,500,000-acre-ft reduction on other upstream projects.

The proposed reduction in the size of the John Day reservoir came after the upriver communities of Arlington and Umatilla protested that they might suffer property loss from the planned and authorized 2,000,000 acre-ft storage capacity.

Three private power companies and the Northwest Public Power Assn. all favor the lower dam and smaller reservoir. The three companies have made a partnership development offer on the project.

Brig. Gen. L. H. Foote, North Pacific division engineer, was ordered by the board to take the proposal back to the field for further study. He expressed confidence that replacement storage will be found in the engineers' current review of the main control plan.

Bids and Contracts

• **Recent successful bidders** on Bonneville Power Administration contracts were: **L. B. Read,** Portland, to build control house for Big Eddy substation for $105,167; **Murray Bros. Construction Co.,** Bend, Ore., access road and right-of-way for the Reston-Fairview transmission line for $128,030; **General Electric Co.** to supply circuit breakers for $822,817; **National Supply Co.,** Toledo, Ohio, 70 gates and four stoplogs for The Dalles, for $205,156; **Cascade Olympic Co.,** Shelton, Wash., control house at Shelton sub for $64,932.

• **Westinghouse Electric Corp.** has been awarded a $350,000 contract by Sacramento Municipal Utility District for transformers and switch gear to double the capacity of a downtown substation. It marks the beginning of a $500,000 expansion project downtown.

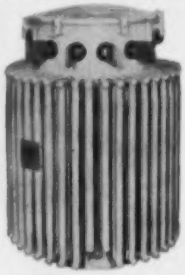
• **Clearing** contracts for Noxon Rapids totaling about $2,000,000 have been awarded to **Union Construction Co.,** Missoula, Mont., and **William Ulrich Co.** of Coeur d'Alene. The two firms will clear the area of the 38-mile reservoir, but progress may be delayed by the rumored purchase of some of the land by speculators who raised prices.

MEET THE NEW

167 KVA

Featherweight

PENNSYLVANIA POLE STAR DISTRIBUTION TRANSFORMER



★ Will replace any single phase 75 or 100 Kva Pole-mounted Transformer to provide 67% to 123% more capacity.
★ Weighs less than 1500 pounds
★ Lower in overall height than average 100 Kva transformer
★ Available in standard voltages up through 13,200 volts
★ The FIRST 167 Kva transformer made for direct pole mounting

For further information, contact

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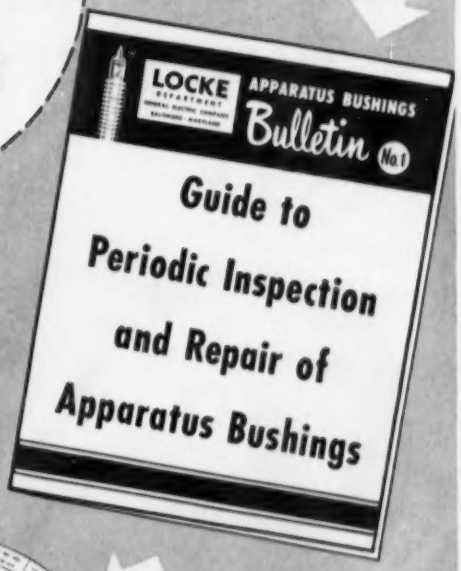
If your job involves apparatus bushings . . .
you'll find this new 6-page booklet very useful. Up-to-date, authoritative.



If your job involves switch & bus insulators . . .
the Cantilever Strength Estimators make it easy for you to determine cantilever load applicable to upright or underhung cap and pin type Switch & Bus Insulators, at various distances beyond the free end of their mounting.

The Switch & Bus Insulator Selector is a specially designed, easy-to-use circular slide chart. With it, you can quickly determine the mechanical and electrical characteristics of an insulator stack for any given operating voltage or BIL.

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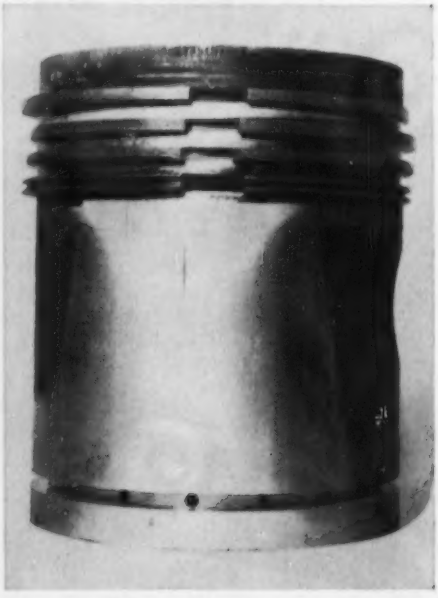
Standard Engineer's Field Report

CASE HISTORY
LUBRICANT RPM Delo Oils
FIRM Del Este Water Company Modesto, Calif.

Engine powers pump for 28,000 hours—sleeve wear is less than 0.002 inch!



PUMPING UP TO 2200 GALLONS OF WATER PER MINUTE, a 165 h.p. natural gas fueled Waukesha engine ran 24 hours a day for more than three years in the Del Este Water Company plant at Modesto, California. Driving a turbine pump, it worked against a constant head, with speed controlled to maintain a set pump discharge pressure. In spite of this tough service, RPM DELO Special Lubricating Oil kept engine in perfect operating condition right up to time of inspection. Oil consumption actually was less for the last 8000 hours service than for the first 8000. Inspection showed sleeve wear only 0.001 to 0.0015" with no taper; crankshaft "miked" within factory standards. As shown above, rings and grooves are clean, sleeves unscored. Same sleeves and pistons were reinstalled and engine went back into pumping service.

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TRADEMARKS "RPM DELO" REG. U.S. PAT. OFF.

FOR EXPERT HELP on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative, or write to 225 Bush Street, San Francisco, California.

Why RPM DELO Oils prolong engine life

Special compounds stop corrosion

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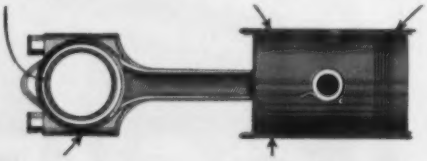


Inhibitor resists foaming

Metal-adhesion qualities keep oil on parts in running or idle engines

STANDARD OIL COMPANY OF CALIFORNIA

NOTES ON THE TRADE

• **Admiral Corp.** broke ground Sept. 16 for a new electronic research laboratory at the Stanford Industrial Park, Palo Alto, Calif. John F. Gilbarte, vice-president of the company's government laboratories division, turned the first spade of earth with several civic, military and university notables present. The building will be 15,000 sq ft originally, with planned expansion to 60,000 sq ft. The laboratory will be devoted to advanced electronic development of the company's civilian and military products.

• **Lynch Carrier Systems** Inc. has moved to 695 Bryant, San Francisco, from its previous location at 96 Jessie.

• **New address** of H. F. Soderling Co. is 1729 First Ave., Seattle 4, Wash. The company now has larger and better quarters with parking space.

• **Line Material** Co. has appointed **P. J. Maloney** to the position of fiber products sales engineer for the States of California, Arizona and Nevada. Maloney is a specialist in applications of the company's fiber conduit in the electrical industry. He will headquarter at the Los Angeles office.

The new Palo Alto plant of Preformed Line Products Co. is attractive—and well lighted

• **Yale & Town Mfg.** Co. has opened a factory branch for sales and service of its materials handling equipment at 563 Second St., San Francisco, under the managership of **H. M. Stiles.** A complete stock of parts will be maintained.

• **Electric Specialty** Co. of Los Angeles has moved to 2820 E. 12th St. and has a new telephone number, ANgelus 9-9511.

• **Stoddard Electric,** Orofino, Idaho, is now a distributor for Allis-Chalmers motors in five counties in the state. Counties are Latch, Clearwater, Nez Perce, Idaho and Lewis.

• **Rome Cable** Corp. has transferred **R. D. Golly** to its Los Angeles office as sales representative and engineer. Golly was formerly in Chicago.

• **The Board of Fire Underwriters** of the Pacific is now located at 320 California St., Room 310, San Francisco 4, Calif. **Thomas A. Lloyd** is assistant district engineer.

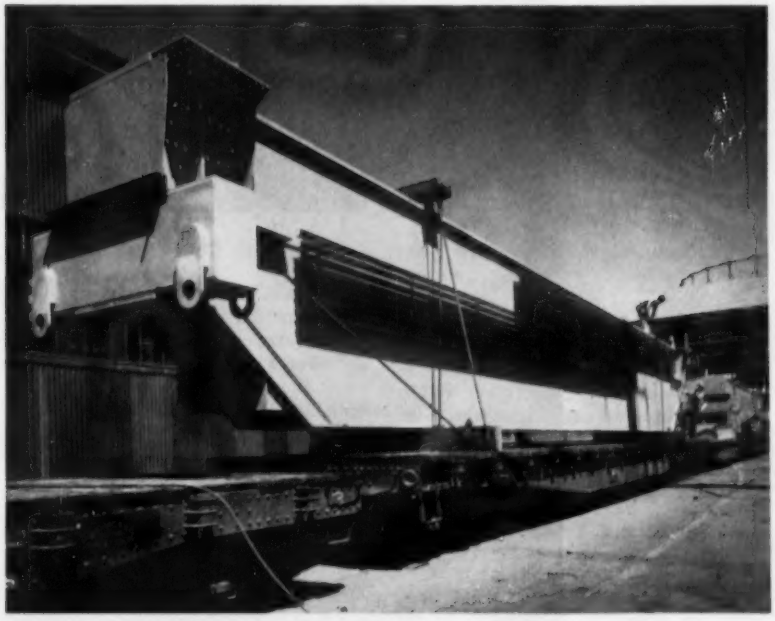
• **Bay Counties Electric Supply** Co. has changed names and will now operate as the **Phillips & Edwards Electric** Corp., East Bay branch. Address is 10000 Edes Ave., Oakland 3, Calif. Frank McNamara is manager; Leo Manousos, Fred Jones and George Quinn are salesmen.

• **Moe Light** Division of Thomas Industries Inc. is opening a new West Coast plant and factory showroom Nov. 4 at 6423 E. Washington Blvd., Los Angeles. **A. O. Grotenhuis** is regional manager of Moe Light.

• **John H. Ormand** Co., 2519 Seventh Ave., Oakland 6, Calif., is new sales agent for Southern States Equipment Corp. in northern California and northern Nevada.

• **Richard G. McLaughlin** has been appointed field applications engineer for the Los Angeles district sales and service office of Raytheon Mfg. Co.'s equipment marketing division. Microwave, telecast and communications equipment and power supplies for the telephone and utility industries come under his supervision.

• **Wagner Electric** Corp. more than doubled its Portland warehouse space with construction of a new building at 3460 N.W. Industrial St. Both the automotive parts and electrical divisions are housed in the 20,000-sq-ft building. **Leslie Poole** & Associates designed the building.



Pictured is a power-house crane for The Dalles that is believed to be the largest ever built on the West Coast. Moffett Engineering Co. employees are shown as they make ready to ship the 370-ton-capacity crane to its destination. Two cranes are to be installed

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NEWS ABOUT PEOPLE

Seven Top Changes At Arizona Utility

Seven major changes in the executive organization of Arizona Public Service Co. have been announced by Walter T. Lucking, president. The company's southern division was divided into three divisions, creating two more managers' posts.

William P. Reilly is now vice-president in charge of division operations; F. T. Fallon Jr. is vice-president and manager of the renamed Phoenix Metropolitan division; Lee H. Poe is vice-president and manager of the northern division; L. R. Kimmich is manager of the new Yuma division; W. E. Martin heads up the western division and Paul B. Beville Jr. is manager of the remainder of the southern division.

Earlier, the company announced that M. M. Bridgwater has been named superintendent of operations for the state-wide operations. He moved to the new job from Prescott where he was general superintendent of the northern division.

WWP Adds Department And Promotes Lucas

The selection of J. Harry Lucas, Spokane division manager for Washington Water Power Co., to head up the company's new department of personnel and industrial relations brought about other advancements of employees.

George Brunzell succeeded Lucas as division manager and was in turn replaced as Spokane division plant superintendent by Lee Fanning. Fanning was formerly assistant to Brunzell.

• **N. H. Callard,** director of operations and maintenance for Bonneville Power Administration since early 1954, has announced plans to retire on advice from his physician. His position will be filled by appointment. He was formerly with Westinghouse Electric Corp., Hilo Electric Co., the Navy's Bureau of Ships and the Office of War Information.

• **Jack Rollefson** is new chief engineer of the Clallam County (Wash.) PUD. He succeeds **Hugh Macauley** who has joined the Industrial Service Co. of Roseburg, Ore. Rollefson was former assistant superintendent of the Lewis County PUD.

Bridgwater

• **Samuel B. Morris,** general manager of Los Angeles Department of Water & Power, retired Oct. 1. He served as general manager from 1944 until retirement.

Peterson

• **William S. Peterson** has been named general manager and chief engineer of the Los Angeles Department of Water & Power. He has served in the department 30 years and has been chief engineer since 1950. He succeeds Samuel B. Morris who retired Oct. 1.

• **Don Thompson,** former manager of Douglas County (Wash.) PUD, is new superintendent of Ellensburg, Wash., City Light. He succeeds **Jack Kennedy,** who moved to Seattle.

• **Clayton E. Johnson** is new manager of the West Coast warehouse of Nutting Truck & Caster Co. The warehouse is in Oakland, Calif.

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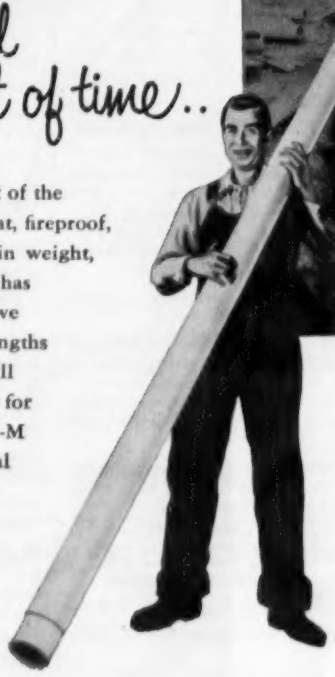

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STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) showing the ownership, management, and circulation of Electrical West, published monthly at Los Angeles, California, for October, 1955.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, McGraw-Hill Company of California.....68 Post St., San Francisco 4, Calif.
Editor, George C. Tenney.....68 Post St., San Francisco 4, Calif.
Managing editor .....None
Business manager, T. H. Carmody, Jr.....68 Post St., San Francisco 4, Calif.

2. The owner is: McGraw-Hill Publishing Co., Inc., 330 West 42nd Street, New York City 36, N. Y. Stockholders holding 1% or more of stock: Donald C. McGraw and Willard T. Chevalier, Trustees for Harold W. McGraw, Donald C. McGraw and Elizabeth M. Stoixfus, all of 330 West 42nd Street, New York City 36, N. Y.; Donald C. McGraw and Harold W. McGraw, Trustees for Catherine M. Rock, 330 West 42nd Street, New York City 36, N. Y.; Donald C. McGraw, 330 West 42nd Street, New York City 36, N. Y.; Mildred W. McGraw, Madison, New Jersey; Grace W. Mehren, 536 Arenas Street, La Jolla, California; Touchstone & Company, c/o Wellington Fund, Inc., Claymont, Delaware.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

T. H. CARMODY, JR., Business Manager

Sworn to and subscribed before me this 26th day of September, 1955.

[SEAL] DOLORES COWLES

Notary Public in and for the City and County of San Francisco, State of California.

(My commission expires Oct. 25, 1956)

- **Harvey N. Skow** has been named engineering manager for Westinghouse Electric Corp.'s Central Pacific District. He will be responsible for engineering activities associated with the application of apparatus in northern California and western Nevada, with headquarters in San Francisco.

- **R. E. Rogers,** formerly manager of the Los Angeles branch of the Foxboro Co., has been appointed manager of the instrument company's West Coast sales activities. Headquarters for Rogers will be at the new branch factory at San Leandro. **E. W. Pitt** replaces Rogers as Los Angeles branch manager.

- **Edward A. Scanlon** is district manager for Spang-Chalfant Division of the National Supply Co. in new district offices in the Russ Building, San Francisco.

Deaths

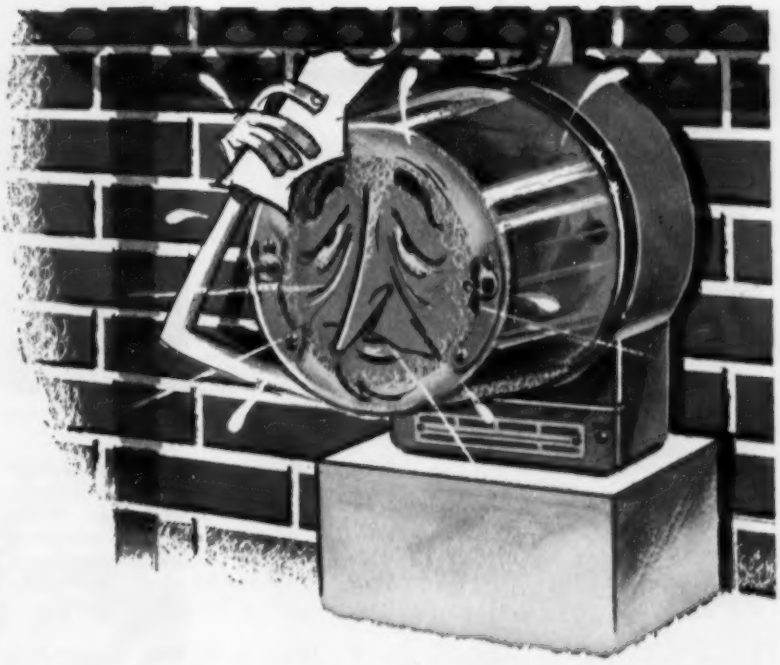
- **M. O. Best,** chairman of the board of Arizona Public Service Co. and prominent Arizona rancher and civic figure, died Sept. 25 in a Phoenix hospital. He had been seriously ill for several months. He was chairman of the board of the former Central Arizona Light & Power Co. and was instrumental in the formation of the present company. He was a native of Arlington, Colo.

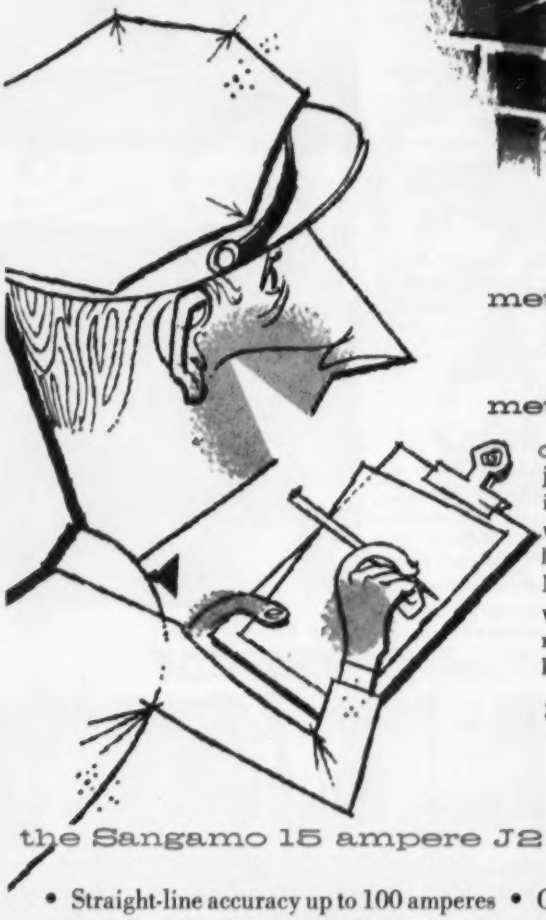
- **Frederick C. Wood,** 52, manufacturer's representative for Dominion Electric Corp., Mansfield, Ohio, died at his home in Belmont, Calif., Sept. 5. His headquarters had been in the Western Merchandise Mart, San Francisco.

- **Vern L. Halliday,** 66, assistant treasurer, Utah Power & Light Co., died of a heart ailment Sept. 19, in Salt Lake City. He had been with the company and its predecessors since 1909. He became assistant treasurer in 1944 after serving in several accounting and auditing department jobs.

- **Bliss G. Sinclair,** 62, a retired electrical engineer of the Seattle and Puget Sound area, died at his home after a long illness. He had worked for Puget Sound Power & Light Co., and was engineer with several government agencies, including the Department of Public Services from 1927 to 1941. He was a 1918 graduate of the University of Washington school of electrical engineering, and member of the AIEE, Society of Military Engineers, Washington, D. C., Society of Professional Engineers, and the Royal Arcanum, Olympia.

if any one of 26 million old meters* could talk...





meterman: Well, how do you feel today, old-timer?

old meter: Howdy, bub! Not so good. When are those fellas down at the light company gonna retire me?

meterman: Why, I don't know old-timer. What's the trouble?

old meter: I'm tired, bub. I just can't keep up with the job. Back in 1939, these Jacksons had a radio, a refrigerator, an iron and a vacuum cleaner... and, of course, their lights. Well, that wasn't so bad. I didn't have any trouble keeping track of a load like that. But today, *whew!* It's just gotten to be too much for me. Now, they've added an electric range, a TV set, an automatic washer and dryer, a dishwasher—and I hear Mrs. Jackson is making a big fuss for air conditioning. I'm not built to measure loads like that. I'm not up to modern living.

* 15 million meters now in service are inadequate for today's loads and 11 million more are in the "doubtful" category according to surveys recently published in *Electrical World*. A copy will be mailed you on request.

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PROFILES

Carey Kanai

Dwight R. Hoopes has been named chief engineer of Southern Nevada Power Co. He was former engineering manager for the Central Pacific Division of Westinghouse Electric Corp. at San Francisco and, before that, engineering and service supervisor of the company's Intermountain territory

Hoopes

From Hawaii to the IAEI convention at Riverside came delegates John Thomas Carey, Honolulu chief electrical inspector, whose "Voice of Hawaii" calls consistently for a convention over there, and K. Kanai, electrical contractor, proprietor of High Grade Electric Co., who added his plea

When F. Edwin Blair of Pasadena (left) relinquished chairmanship of the Southern California Section, IES, to Roy H. Kreyser, lighting engineer, Los Angeles Department of Water & Power, Prof. Dan Finch, regional vice-president of IES, just back from an international illumination congress in Switzerland (See p 122) conducted the installation of new officers ceremony, Sept. 7

Blair Finch Kreyser

About to light out and certify commercial and industrial lighting installations are members of Northern California Electrical Bureau's lighting committee. Manager Bert Reynolds presents the details of the Certified Lighting program here to a group of equipment manufacturers' representatives who are backing the promotion with contractors and utility

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These 20th century pioneers have created a challenge of tremendous growth for the West's electric industry, which must keep ahead of the demand for more and more power. As a working partner of western electric industry, PCEA helps provide some of the ideas and determination to meet that continuing challenge.

One of PCEA's key functions is to serve as a clearinghouse in which members can exchange ideas and experiences on common problems. What does that mean to you? Well, for one thing, it could help you to solve that business problem you're facing right now. Chances are someone in PCEA has met—and solved—a similar situation. Contact either of our offices for further information and remember that in PCEA . . . gold is where you find it!

PACIFIC COAST ELECTRICAL ASSOCIATION

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